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An Address
ON
SURGICAL CONVALESCENCE.

DELIVERED BEFORE THE MANCHESTER SURGICAL SOCIETY

BY

CHARLES ROBERTS, M.B., B.S., F.R.C.S.,

SURGEON, MANCHESTER ROYAL INFIRMARY; PRESIDENT OF THE SOCIETY.

IT is especially in war time that the problems of convalescence are most clearly perceived, and it was during a period of the war in which part of my duty was to inspect medically a group of Red Cross convalescent hospitals that the importance of convalescent treatment impressed itself on my mind, and I determined to devote more attention to the follow-up and after-care of surgical patients.

Since that time it has been my practice at the Manchester Royal Infirmary to devote a part of one morning each week to seeing patients who have been discharged from my wards. All patients, on leaving hospital, are given cards and are instructed to attend, and a record is kept of their progress and of the final result of treatment. In many instances one attendance suffices, in others repeated visits are made. For example, after operations for gastric and duodenal ulcers patients attend every three months during the first year, and at intervals of six months during the second year. This practice has been a source of much interest, and many lessons have been learnt.

There is little doubt that surgeons are tempted to concentrate too much on the operations themselves. We live in an age of speed. Operations are becoming more or less standardized and patients are discharged as soon as possible, often to be lost to the surgeon for ever. But the human body is not a mere machine, and the hospital is not comparable to a Ford factory. Surgery is something more than the mechanical side of medicine, and the operation is but one therapeutic measure in the treatment of the patient. As one surgeon has said, "Any operator of experience can perform a gastro-jejunostomy, but it takes a surgeon to know how to remove a tube from an empyema." It may be true that the better the operating the less will be the need for after-treatment, and many of our patients will do well if left alone; but many will be restored to complete health more comfortably and more quickly by proper after-care, and some of them will prove failures from want of it. Operative technique has attained a high stage of perfection, and great improvement has been made in pre-operative preparation and immediate post-operative treatment, but the convalescent stage has not received the attention it deserves. The contemporary literature is extraordinarily scanty. I submit that the whole subject requires more scientific investigation. Our attitude resembles too much that of the ancients, as illustrated in the writings of Plato, who said:

> "In all well ordered states every individual has an occupation to which he must attend, and has therefore no leisure to spend in continuously being ill. This we remark in the case of the artisan, but, ludicrously enough, do not apply the same rule to people of the richer sort. When a carpenter is ill he asks the physician for a rough and ready cure, an emetic or a purge, or a cautery or the knife—these are his remedies. And if someone prescribes for him a course of diuretics, and tells him that he must swathe and swaddle his head, and all that sort of thing, he replies at once that he has no time to be ill, and that he sees no good in a life which is spent in nursing his disease to the neglect of his customary employment; and therefore bidding good-bye to this sort of physician, he resumes his ordinary habits, and either gets well and lives and does his business, or, if this fails, he dies, and has no more trouble."

I have recently undertaken an inquiry into the duration of convalescence and the symptoms that arise between the time of leaving hospital and of return to light work or full occupation; 825 letters were sent out to male patients who had been operated on in the Manchester Royal Infirmary for gall stones, duodenal ulcer, chronic appendicitis, inguinal hernia, and haemorrhoids; 630 replies were received, and 130 of these were discarded as the replies were unsatisfactory. Letters were dispatched in batches until 100 satisfactory replies had been received from cases of each operation. The results are shown in the table.

TABLE I.—*Average Duration of Convalescence after certain Operations.*

Time.	Gall Bladder.	Duodenal Ulcer.	Appendix	Hernia.	Haemorrhoids.
Under 25 days	1	1	2	7	26
25 to 50 days	12	10	20	24	50
50 to 100 days	37	45	41	43	20
Over 100 days	40	38	36	22	4
Still doing light work ...	10	6	1	4	—
Total	100	100	100	100	100

The occupational classification in Table II is based on the two groups of indoor workers and outdoor workers, light and heavy work in each section forming a separate class. Class A contains those engaged in heavy outdoor work—carters, labourers, colliers, blacksmiths, bricklayers;

TABLE II.—*Average Period of Convalescence in Relation to Occupations.*

Occupational Class.	Age.	Return to Normal Work.	Return to Light Work	Period of Light Work.	No. of Cases.
I. *Gall Bladder.*		Days.			
Class A	46.4	149.5	28.5	51.2	12
„ B	46.4	110.3	31.4	33.3	9
„ C	50	91 5	21.4	14.5	13
„ D	44.7	110.3	29.2	14.3	55
Average	46.9	115.4	—	—	90
9 still doing light work; 1 unable to work					10=100
II. *Duodenal Ulcer.*					
Class A	41.5	143.4	34.4	47.5	26
„ B	38.4	112	59.9	21.6	9
„ C	40.1	125.1	44.5	26.2	22
„ D	38.9	72.3	17	17.9	37
Average	39.7	113.2	—	—	94
6 still doing light work					6=100
III. *Appendix.*					
Class A	34.5	119.3	45.5	91	10
„ B	40.9	106	21.5	15.7	20
„ C	32.8	105.3	34.5	21.3	30
„ D	30	85.5	7.8	10.8	39
Average	34.5	104	—	—	99
1 still doing light work ... ... —					1=100
IV. *Inguinal Hernia.*					
Class A	38.3	116.1	24.3	32.2	29
„ B	29.5	56.8	23.5	12.7	10
„ C	35.2	88.5	23.8	33.6	29
„ D	35.1	75.6	16.5	19.5	28
Average	34.5	84.2	—	—	96
4 still doing light work					4=100
V. *Haemorrhoids.*					
Class A	43	40.7	8.5	8.4	25
„ B	43.3	38	3.6	2.8	18
„ C	38.9	44.2	4.8	14.9	30
„ D	38.4	40.7	2.9	5.3	27
Average	40.9	40.9	—	—	100

Class B, light outdoor work—tram guards, tram drivers, police constables, motor drivers, painters, postmen; Class C, heavy indoor work—fitters, engineers, joiners, stokers; Class D, light indoor work—shop assistants, tradesmen, clerks, professional workers. In each instance the period of convalescence is reckoned from the date of operation, not from the discharge from hospital.

TABLE III.—*Results of Operations as Manifested by Percentage Return to Work.*

Disease.	Average Age.	Returning Direct to Full Work.	Returning via Light Work.	Still Doing Light Work.	Complaining of Symptoms
		Per cent.	Per cent.	Per cent.	Per cent.
Gall bladder	46.9	62	28	10	21
Duodenal ulcer ...	39.7	61	33	6	28
Chronic appendix ...	34.5	73	26	1	37
Inguinal hernia ...	34.5	58	38	4	20
Haemorrhoids ...	40.9	82	18	—	13

Symptoms noted after certain Operations.

Gall Bladder.—After-symptoms complained of in the gall-bladder cases were: recurrence of original symptoms, one case; flatulent dyspepsia, three cases; biliousness and pain in gall-bladder area, one case; cramp-like or colicky abdominal pains with occasional diarrhoea; pain and neuralgia in the scar; pain and heavy feeling in the scar on exertion; weakness and bulging of the abdominal wall in the region of the scar; and general debility.

Gastro-jejunostomy.—The symptoms complained of after gastro-jejunostomy for duodenal ulcer were: dyspepsia, five cases; vomiting, three cases; biliousness, one case; flatulence, four cases; symptoms as before operation, one case; abdominal distension, one case; pains in region of scar, one case; pain in the back, one case.

Chronic Appendicitis.—After operation for chronic appendicitis patients complained of pains in abdomen, eight cases; vomiting, four cases; flatulence, two cases; biliousness, one case; severe constipation, three cases; looseness of bowels, one case; pain, neuralgia, or stiffness in the region of the scar, six cases; sleeplessness and nervousness, one case; pains similar to those before operation, one case.

Radical Cure.—After radical cure of inguinal hernia the symptoms arising were pain, either aching or neuralgic, in the region of the scar, a feeling of weakness or dragging in the same area, stiffness in the surrounding muscle, and backache.

Haemorrhoids.—After the operations for haemorrhoids symptoms included impaired control of the bowel, two cases; loose swollen skin around the anus, two cases; irritation or itching at the anus, six cases; feeling of fullness in the anal region, one case; rectal discharge, one case; rectal bleeding, one case; severe constipation, one case; and pain in sacral area, two cases.

E. W. Bridgman has published statistics on the duration of normal convalescence based on his experience at the convalescent section of a group of base hospitals during the war. In the camps graduated exercise under military discipline was carried out, whilst relaxation, both mental and physical, was carefully provided for. A follow-up system was instituted, and it was ascertained that recovery was complete in more than 97 per cent. of cases. To compare the duration of hospitalization of patients passing through the camp with those discharged directly to duty a group of records was obtained from the hospital centre of the period before the opening of the convalescent camp. No follow-up system had been instituted for these patients, but Bridgman states that he had seen some of those discharged return to the hospital for relapse, weakness, painful wounds, or inability to keep up, and, after long intervals, some returned with functional mental disorders. The following table shows the average stay in hospital and camp under the two systems.

TABLE IV.—*Experience of Convalescent Camps.*

Diagnosis.	No. of Cases.	Average Stay in Hospital of Patients not going to Camp.	No. of Cases.	Average Total Stay in Hospital and Camp.
		Days.		Days.
Haemorroidectomy ...	21	20	25	45
Herniotomy	31	24	41	50
Hydrocelotomy ...	6	22	7	54
Tonsillectomy... ...	10	20	8	37

He concludes that the average herniotomy needs several weeks of care before the patient is normal again, instead of the three and a half that are commonly allowed, and he emphasizes the importance of graduated exercises and military discipline under real medical supervision in favouring and hastening convalescence. He states that the doctors and ward masters soon became adept in handling the occasional malingerer.

CONCLUSIONS.

I think my investigation shows that the transition stage between serious injury, illness or operation, and normal health is undoubtedly an episode of very great significance and economic importance. Convalescence is not an automatic process, but a definite state of illness in which arise minor ills and complications and deviations from the normal, and some of these may become fixed and serious. I doubt if operating surgeons sufficiently appreciate the shock and the prolonged effects of extensive operations. Moreover, the illness involves a change of habits and environment, and the patients suffer from the effects of enforced rest with its accompanying lack of exercise and deficient elimination. After the more serious cases convalescence is often as much a state of mind as of body. The wounds heal, but the patients are not themselves. All the organs are below the normal and nervous energy is diminished. They react excessively to any form of mental or physical stimulus. They tend to become introspective, and with this there may arise a state of nervous irritability leading at times to hysteria and neurasthenia. Patients often suffer from various slight ailments such as dyspepsia, constipation, and the neuralgias, and occasionally the most prominent feature is sleeplessness. Our aim must be to get the patient to resume his ordinary habits as quickly as is consistent with safety. Some are in danger of relapse in their desire to go too quickly, and must be restrained from doing too much. Others require constant encouragement to enable them to make the progress desired.

Few patients have a clear idea of what their conduct should be after leaving hospital or nursing home. They are very largely influenced by groundless fears and by the advice of ignorant or too solicitous friends. The family physician, when consulted, is not always a reliable guide, from lack of knowledge of the individual case or unfamiliarity with the surgical aspects of the particular condition. It would be of immense help if all medical practitioners could follow up their patients to hospital, be present at any operation performed, and visit them occasionally afterwards. Opportunities for discussion as to after-treatment would then always be possible, and, in the transfer of medical responsibility from hospital control to that of the practitioner, continuity of medical care would not be lost. Failing this, I think it is incumbent on the surgeon to communicate directly with the practitioner when a patient is discharged from hospital, and give him all necessary information. Much help can be afforded the patient by the personal advice of the surgeon. The condition found and the nature of the operation should be suitably explained, and he should be reassured whenever possible as to the future. He should be warned of the possibility of minor symptoms that may arise during convalescence, and of the dangers that ensue from morbid introspection. Particular cases require special advice—for example, enormous help may be given by instruction in the management of a colostomy. Some patients must be compelled to live within definite limits after certain operations. This is notably so in abdominal disease, especially after operations for gastric and duodenal ulcers, gall-stone operations, and when a condition of visceroptosis with intestinal stasis is present. In these instances I have found it most convenient to use printed charts of general instructions with special instructions as to diet.

The charts that follow are used in cases after operations for gall stones and duodenal ulcer.

INSTRUCTIONS AFTER OPERATION FOR GALL STONES.

Take frequent small meals rather than heavy meals.
Take a tumblerful of hot water night and morning.
Take a drink of hot water at the end of each meal.
Take salts in the morning once or twice a week.

Diet Advised.—Skimmed milk. Tea. Soups made with milk. Vegetables. Tapioca. Rice, etc. Cereals, oatmeal, etc. Fish, such as whiting, turbot, brill, sole. White meat and lean meat, boiled, grilled.

or roasted. Potatoes, mashed or in their jackets. Turnips. Spinach. Artichokes. Mild cheese. Fruit after three months.

Forbidden.—Fat and eggs. Stewed and fried foods. Sweetbreads. Liver. Duck. Kidneys. Pork. Black puddings. Game. High or spiced dishes. Oily fish. Soft roe. Herrings. Salmon. Sardines. Cooked butter. Peas. Cabbage. Raw vegetables. Strong cheeses. Aerated waters. Alcohol.

DIET AFTER GASTRO-ENTEROSTOMY.

Guides to Diet:

1. Easily digested food.
2. Large meals should never be taken.
3. Preferably there should be no drinking during meals.
4. Food and drinks should not be taken hot.
5. Eat slowly, masticate thoroughly, avoid bulky meals.
6. One glass of milk between meals and one before retiring.

Breakfast.—Carefully made porridge. Egg—lightly boiled. White fish, boiled or baked. Cocoa or weak tea with plenty of milk. Cold dry toast and margarine or butter. Cold boiled ham.

Other Meals.—Oysters. A little roast beef, well cooked, mutton or veal. Clear gravy. Boiled beef. Chicken. Tripe. Spinach. Cauliflower. Mashed potatoes. Macaroni. Milk puddings. Junket. Blancmange. Custard.

Forbidden.—Fried fish in fat. Smoked fish. Bacon. Sausage. Meat pies. Meat puddings. Stews. Made-up dishes. Re-cooked meats. Cabbage. Brussels sprouts. Carrots. Turnips. Parsnips. Watercress. Fried potatoes. Pepper. Mustard. Vinegar. Pastry. Cakes. Brown bread. Jam. Sweets. Cheese. Coffee. Alcohol.

My investigations have shown that success or failure in the treatment of gastric and duodenal ulcers depends far more on proper after-care than the exact type of operation chosen. I am strongly convinced that the attitude of those surgeons who affirm that they have no use for any operation which does not completely cure the patient is entirely wrong.

A change of air greatly assists the convalescent. He gets away from the environment of his illness. He sees new scenes and new people and gets new interests. Routine and regularity should mark the period. Each day should be mapped out with the proper intervals of rest and graded exercise, and the amount of mental recreation should be apportioned. While it is difficult to estimate accurately the effects of post-operative respiratory exercises and physical exercises on the Swedish principle, there is no doubt that the general circulation is improved, the bodily functions are more normally performed, muscular weakness is diminished, and the patient returns to complete health more quickly. I hold strongly that systematic exercises should be a routine measure in the convalescent period. The various measures of physiotherapy also hold a high place in conducing to rapid recovery.

For the convalescent period the hospital patient's own home does not, as a rule, provide an environment conducive to rapid recovery, and though many may be sent to convalescent homes there will always be a large proportion of patients for whom it is not possible to provide accommodation in these institutions. I strongly believe that there should be a convalescent department attached to each hospital. In this way we should eliminate the neglected period that now prevails between the completion of active surgical treatment and the time of return to full occupation. To this department there could be attached a social service, for it has been estimated that 30 per cent. of patients discharged from hospital require help in this direction. The medical staff in charge should be specially trained in convalescence. Here patients would be completely investigated and graded; their requirements as to diet, discipline, and physical and mental recreation would be determined, and any disabilities that arose or whose presence had been overlooked could be dealt with and the malingerer eliminated. Advantage could be taken in many instances to improve the general health.

THE RESULTS OF INSULIN THERAPY IN DIABETES MELLITUS.*

BY

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ABOUT four years have elapsed since insulin became generally available in this country for the treatment of diabetes mellitus. This is not a very long period in which to judge the ultimate effect of insulin on diabetes, but it is sufficient to enable us to come to some definite conclusion as to its more immediate and direct influence on the disease. The theoretical considerations which govern the action of insulin in diabetes are quite clear. The oxidation of our foodstuffs requires the presence of a substance which is normally supplied by the pancreas. When, for some reason, the specialized pancreatic islet cells fail to supply this substance in the necessary amount, an interference with the burning up of sugar and fat results. This is the basis of diabetes mellitus. Since it is now possible to supply this essential substance in the form of insulin, it might be thought that the treatment of diabetes should no longer present any difficulties, and that all that is necessary is to supply sufficient insulin to make up for the deficiency in any particular patient.

The difficulty, however, is to supply the exact amount of insulin necessary for the varying requirements of the organism. In the body there is a mechanism which regulates the production of insulin in accordance with the tissue needs at any given time. The amount of insulin required by the body is dependent on many factors, and varies under different conditions. The artificial use of insulin by injection is attended by the drawback that we cannot regulate the amount required to supply the exact demands at any given time. It is true that in some patients we can get fairly close to the theoretical needs, but this can only be accomplished by paying great attention to various factors, such as diet and exercise. Often it is impossible to regulate the artificial supply of insulin so as to simulate the normal mechanism. Though we can now supply the necessary insulin when the body can no longer secrete it, we can, so far, do but little to reproduce the results of the normal automatic mechanism which regulates the production of insulin according to the prevailing needs at the moment. This is one of the main difficulties in insulin therapy, but under ordinary conditions this drawback can generally be more or less overcome. It is when diabetes becomes complicated by various infections that our troubles really assume a serious aspect. In certain of these conditions insulin seems to lose its normal activity, and, in spite of greatly increased dosage, the patient may sometimes succumb. The healthy individual when suffering from a similar infection usually shows no disturbance of metabolism such as is seen in diabetes; it must, therefore, be assumed that insulin, when supplied naturally by the body tissues, is more effective in these conditions than it is when given artificially by injection. Indeed, in certain cases of diabetes complicated by severe infection, insulin artificially administered proves of little or no benefit.

Before considering the effects of insulin in diabetes it will be necessary to consider the results obtained by diet in the days before insulin was available.

Results of Dietetic Treatment of Diabetes.

For some years before the isolation of insulin much attention was paid to the dietetic treatment of diabetes, and many claims were made on behalf of this method. While it was generally agreed that the only means of influencing the disease in any way was by means of properly regulated diet, the outlook for the average patient suffering from the disease was gloomy in the extreme. Generally, it was found that suitable diet had a wonderful effect to begin with, but, in spite of the greatest care, the patient after a time gradually began to show his old symptoms, and soon a point was reached at which the strictest dietetic measures no longer prevented the occurrence of severe glycosuria and ketosis. From this point the patient usually went steadily downhill, and soon coma or some intermittent infection terminated the scene. The duration of life under dietetic treatment depended, of course, on the

*A paper opening a discussion in the Section of Medicine at the Annual Meeting of the British Medical Association, Edinburgh, 1927.

severity of the lesion, but, unfortunately, as it is generally seen in young people, the disease is a steadily progressive one, and after a time its course cannot usually be stayed to any appreciable extent by diet.

No doubt so-called diabetes in elderly subjects often presented an entirely different picture, and frequently responded well to diet. In such patients, however, glycosuria is the main feature, and there is generally little or no ketosis. In many of them no evidence of disturbed oxidation can be obtained, and the patient may suffer little or no inconvenience. This type of case is really not a true diabetes, but a simple glycosuria which is probably dependent on an inability on the part of the liver and muscles to store sugar in the normal manner. Consequently hyperglycaemia results, and sugar is passed in the urine. The usual symptoms of diabetes are absent, or, if present at all, are of a very mild nature. These cases should not be classified as true diabetes; there is no tendency to coma, and the glycosuria can often be controlled by dietetic measures. Not infrequently the sugar is detected as the result of a routine examination of the urine. Often the glycosuria does no harm whatever to the patient, and though the condition may sometimes develop into a true diabetes, yet, in my experience, this is a comparatively rare sequel. Such cases do not come under the heading of true diabetes.

In considering the results of dietetic treatment it is essential to remember the difference between these two types, for the ultimate effects of diet depend almost entirely on the nature of the cases treated. Elderly patients suffering from glycosuria with little or no ketosis frequently do exceedingly well on diet. Patients suffering from true diabetes ultimately do very badly, though the results may be satisfactory for a short time. The success or failure of dietetic treatment, as indicated by the experience of any particular observer, depends very largely on the number of cases of ordinary glycosuria he includes under the term "diabetes." If many of the patients were suffering from nothing more serious than the well known glycosuria of the elderly individual, then dietetic treatment may appear to give excellent results. When, on the contrary, only cases of true diabetes with the usual symptoms are included, the results of diet are absolutely unsatisfactory in the great majority of patients.

When considering the effects of insulin, it is really with diabetes as it shows itself in its typical form that we have to deal. Usually diabetes is a disease of youth or of middle age, though not infrequently it may be seen in old age. On the whole, true diabetes is more common in patients under 45 years of age, while glycosuria due to lack of storage generally occurs after this age. In arriving at a definite conclusion as to the effects of insulin in diabetes it is necessary to bear in mind that it is its beneficial effect on true diabetes that is really important. In the other class of case coma does not intervene, and death is usually due, not to the effects of the glycosuria, but to some other disease.

Before the days of insulin many observers claimed excellent results from dietetic treatment. Others frankly confessed that diet, however carefully followed by the patient, was quite useless after a short time. Several years ago I carefully examined my figures for patients suffering from typical diabetes who were treated by dietetic measures. The results showed that death took place on an average in about five years or rather less after the dietetic treatment began. I have had communications with various authorities in other countries on this subject, and the information I obtained was to the effect that the average duration of life in patients on dietetic treatment was from four to six years. These cases, of course, did not include patients suffering from glycosuria without ketosis. We may, therefore, take the view that any patient suffering from diabetes in the true sense of the term is unlikely to survive for more than five or six years on an average when the treatment is restricted to dietetic measures. Indeed, in severe cases, two to three years is often all that may be reasonably expected. Consideration of these figures will enable us to appreciate the changes brought about by insulin therapy.

The Results of Insulin Therapy.

In the four years that have elapsed since insulin became generally available for the treatment of diabetes 291 patients suffering from typical diabetes have been treated in a special clinic in the Medical Unit of St. Thomas's Hospital. All these patients showed definite ketosis, and the majority of them were young or middle-aged. Cases of ordinary glycosuria without ketosis are not included in this list. Each patient was first treated as an in-patient in the ward, the diet and insulin dosage being carefully worked out. After being discharged from the ward the patient attended the clinic at definite intervals. As an outside patient he was usually being looked after by his medical practitioner. When any change in diet or in insulin dosage was considered advisable, the practitioner was informed of the result of the examination, and the suggested changes indicated to him. The complete treatment of the case, however, was, as far as possible, controlled by the special clinic. The following figures show the results of insulin treatment of these cases up to date. In this connexion I should like to thank Dr. Crozier of the medical unit for his help in keeping records of these cases and for assisting me in compiling the results.

Year of admission of patient.	No. of patients admitted.	No. of deaths to date.
1923-24	77	5
1924-25	76	2
1925-26	68	3
1926-27	70	2
Total	291	12

Several of these patients were admitted in coma; three of them developed coma on three different occasions and a few more were in coma on two occasions. All these patients are now doing well. Two patients with tubercle bacilli in their sputum are still alive and in fairly good health.

Of the twelve deaths, one, a girl of 19, developed coma outside, and was treated by her local doctor. Another was treated in hospital, but was admitted at a rather late stage, and though apparently a case of uncomplicated diabetic coma, she failed to respond to insulin. Three of these cases recovered from coma, but died of cardiac failure. In all the others coma developed as the result of some such complication as influenza, pneumonia, or septic lesion.

These figures show a death rate of almost exactly 4 per cent. As they were all well marked cases the figures indicate a very extraordinary improvement over the results of dietetic treatment. Judging from the death rate prior to the use of insulin, the average number of deaths in these 291 patients would have been much greater if treatment had been restricted to diet alone. While it is quite impossible to give anything like exact figures, it is nevertheless possible to arrive at some probable conclusions as to what would have happened if no insulin had been used in these cases.

If we take six years as the average duration of life on diet alone, it appears that of the 77 patients admitted in 1923-24 at least half of them would now be dead. Taking everything into consideration, it seems probable that more than one-third of the total number of these 291 cases would not be alive now. In addition to the above patients, I have seen a fair number regarding whom I have no definite statistics. The general impression conveyed, however, is that the average results of insulin treatment were somewhat similar. So far, I have only seen one diabetic patient who failed entirely to respond to insulin administration. As no *post-mortem* examination took place in this case it is possible that some other complication was present.

These results point to the conclusion that practically all uncomplicated cases of diabetes in young or middle-aged people can be controlled by the judicious use of insulin. It must also be remembered that the general physical condition of diabetic patients treated by insulin is altogether different from that which obtained under dietetic treatment. In many cases dietetic treatment was so severe that the patients could not be induced to continue with it. Some of them quite frankly stated that they preferred death to the physical agony which they

endured. In almost all bad cases the period of a year or so preceding death was usually most distressing and hopeless. Now all is changed. The disease which was formerly so grave has been shorn of many of its terrors, and, in my opinion, it ought to be possible to control any ordinary case of uncomplicated diabetes and to restore the patient to a fair degree of health and comfort.

Some Difficulties encountered in the Use of Insulin.

In uncomplicated cases of diabetes insulin has proved to be a very excellent remedy. With a well balanced diet and suitable dosage of insulin patients usually get on all right and give little trouble as long as infections of various kinds are avoided. When a diabetic patient becomes ill from some acute disease it often happens that the insulin loses its effect to some extent, and a marked tendency to coma sets in. In these circumstances the insulin dose must be very materially increased, perhaps to three or four times what the patient was having previously. Sometimes even much larger doses than this are necessary for a time. The secret of successful treatment of diabetes by insulin lies largely in a recognition of this fact. It cannot be too strongly emphasized that very large doses of insulin may be required when acute infections supervene. Very often, unfortunately, the medical man in attendance on the patient takes the view that some temporary complication, which perhaps makes the patient unable to take his ordinary diet, indicates a decrease in the dose of insulin. Such treatment is often fatal. The dose of insulin should in the great majority of these patients be increased at an early stage of the complication. When this is done in a judicious manner it is my experience that grave consequences can very often be avoided. No doubt the complication itself may sometimes kill, irrespective of the diabetes, but probably the most essential point to bear in mind in the routine treatment of diabetes by insulin is the necessity to give a sufficient amount of insulin when complications supervene.

The Results of Insulin Therapy in Young Children.

It is well recognized that diabetes in the child is a very serious condition, and, in the absence of insulin, is liable to prove fatal in a very short time. On the other hand, the disease is usually well controlled by insulin when a sufficient dose is given. Since nearly all children contract some of the various ailments common to children at some time or other, it is obvious that in the case of very young people there are special difficulties and dangers to contend with. In my experience, however, these dangers are not necessarily so formidable as they might appear to be. Undoubtedly very great care is necessary, and the dose of insulin must at once be increased when the onset of any of these ailments is accompanied by an increase in the diabetic symptoms. When this is carefully done the results on the whole are good. I cannot claim to have seen very many cases of diabetes in young children, but since 1923 I have treated over thirty children varying in age from 2½ to 10 years, and all of these are alive to-day and in quite good health. We have not had a single death from diabetic coma in a child under 10 years of age. Many of these children were first seen while in coma, and a few of them developed coma on at least two subsequent occasions. Some of them have contracted and safely weathered such infections as whooping-cough, measles, and chicken-pox. While it must be admitted that the outlook from the theoretical point of view is not good in the case of children, practical experience suggests that the young diabetic can very often be safely guided through the storms which are peculiar to childhood, and that very satisfactory results can often be obtained.

An interesting question arises in connexion with the possible cure of diabetes by insulin in the young. Definite evidence has been brought forward that regeneration of the islet cells of the pancreas may take place in a young diabetic when the disease is controlled by insulin. From this it might be argued that the administration of insulin in very young people might sometimes effect a cure by allowing new pancreatic cells to develop. Several of my cases now require much smaller doses of insulin than they did at the earlier stages of treatment, but I have not yet seen a single patient whose recovery of tolerance was sufficiently marked to enable him to discard insulin. In some of these young patients there has been so sign of increased tolerance, and the amount of insulin had sometimes to be increased as the child grew older. It seems fairly certain that all these children will find it necessary to continue the administration of insulin throughout life. It is quite certain that the lives of many children who would otherwise die of diabetic coma can be saved by insulin, and that the outlook is not necessarily as black as it is sometimes considered to be. Given a child otherwise healthy, there is really good ground for the view that such a child may reach adult life, and be no worse off than the average patient in whom diabetes first showed itself at a much later stage in life.

Insulin in Elderly and Old Patients.

In old patients, as already indicated, true progressive diabetes with ketosis is not very common, though it is certainly met with from time to time. By far the most frequent condition in these patients is the type of glycosuria already discussed. In an uncomplicated case of diabetes in an elderly patient insulin appears to act as well as it does in the young or middle-aged, but, unfortunately, it often happens that other ailments are present. In these circumstances good results could hardly be expected in general from the use of insulin in old patients, and this is in accordance with experience. Insulin, however, often gives excellent results in many old people who have glycosuria with such symptoms as weakness, neuritis, and local irritation, but whose condition is otherwise good. It all depends whether the lesion is or is not complicated with degenerative diseases, and other changes incident to old age. There is obviously an absence of the recuperative power of the young individual, and allowances must be made for this.

The Use of Insulin in Surgical Conditions Complicating Diabetes.

Insulin has revolutionized diabetic surgery. Before insulin was available the surgeon hesitated as a rule to incur the grave risk associated with an operation on a diabetic patient. In desperate cases, when an operation had to be attempted, coma often supervened and the patient died. Since insulin has become available for the treatment of these patients it is safe to say that, under good conditions, and when treated by someone who understands the use of insulin, the diabetic has about as good a chance as a normal patient who undergoes an operation. This is well borne out by the statistics of the Mayo Clinic. In 667 operations performed on diabetic patients only 20 deaths occurred. Taking into consideration the fact that many of these patients were suffering from arterial sclerosis and other degenerative lesions the results appear to be very satisfactory.

Some Anomalous Statistical Results.

From the excellent results obtained by the use of insulin it might be thought that diabetes would figure no longer in official statistics as an important cause of death. At any rate, it might be considered that the number of deaths officially returned as caused by diabetes would be much reduced, and that this reduction would continue for several years. Since the majority of diabetic patients develop the disease when comparatively young, the natural inference would be that the lives of these patients would be prolonged for many years by insulin; ultimately, when death took place in the usual course of events, though the patient might die of something quite different from diabetes, there would be a tendency on the part of the medical man to return the cause of death as diabetes. Theoretically, then, there should be a marked diminution in the number of deaths from diabetes for several years, while after a certain period an increase might be looked for, but the majority of these deaths should be those of elderly people.

So far as official statistics go, however, insulin has apparently not decreased the number of deaths from diabetes. According to these returns, insulin has failed to affect to any material extent the death rate from diabetes. We are therefore faced with the curious result

that apparently the number of patients dying from diabetes is as high as ever, in spite of the undisputed fact that many lives are saved by insulin. What is the explanation of this? One possible explanation might be that the incidence of diabetes has largely increased during the last few years, and that, despite the beneficial action of insulin, the increase of the disease is so marked as to keep the death rate up to the old level. This view really means that in the absence of insulin the death rate from diabetes would be very materially higher than it now is. Against this view is the fact that insulin is such a potent measure in the treatment of uncomplicated diabetes that even a marked increase in the incidence of the disease should not materially increase the death rate. There appears to be some evidence pointing to the conclusion that there is a tendency for some slight increase in the number of diabetic cases, but this does not explain the difficulty.

An examination of the age of death reveals the fact that the age incidence has shifted, and that for the last few years the majority of diabetic deaths occurred in elderly people. The number of diabetic deaths in young people has very materially decreased. Now, since true diabetes is comparatively rare in elderly people, while simple glycosuria is exceedingly common, it is but reasonable to suppose that the majority of persons returned as having died from diabetes really suffered from simple glycosuria. Since this type of glycosuria does not as a rule produce coma, it is more likely that the majority of these deaths were caused by some condition other than diabetes. The fact that glycosuria happened to be present resulted in "diabetes" being returned as the cause of death. No doubt the recent introduction of insulin has tended to focus attention on glycosuria, and so its presence is more frequently determined. Glycosuria, when present, is such a definite symptom that naturally it would nearly always be mentioned under the term "diabetes" in the official certificate of death.

Again, it is certain that insulin is often not nearly so effective in the treatment of coma in the elderly as it is in the young. Coma is exceedingly detrimental to the heart, and since the heart muscle in old people frequently suffers from some degree of degeneration, it is not unusual for the patient to recover from coma and to die of cardiac failure.

All these facts may play a part in explaining the anomalous official figures which apparently suggest that insulin has failed to reduce the diabetic death rate. These considerations indicate the marked importance of differentiating between cases of true diabetes and those of simple glycosuria.

Results of Insulin Treatment in Coma.

When coma has actually developed much depends on the quickness and energy of the medical man in attendance. The patient should be treated at the earliest possible moment, for the strain on certain of the organs, such as the heart and kidneys, is very great, and, if prolonged, may result indirectly in death.

If the patient is seen at a fairly early stage and no complications are present, recovery should be the rule. I have not had a single death from coma in a young and otherwise healthy patient since insulin became available. In patients suffering from acute infections recovery is more doubtful, but if sufficient insulin is used a successful result should be frequently obtained. Generally speaking, the young diabetic patient, healthy in other respects, should not die from diabetic coma if insulin is judiciously administered at an early stage. In old people the case is very different, for reasons already discussed. Coma in a vigorous sound patient generally responds to insulin, whatever the age happens to be.

Some Points in the Treatment of Coma.

It is generally agreed that the most important measure in the treatment of coma is to give insulin in sufficient amount at the earliest possible moment. Whether or not this should be combined with the administration of sodium bicarbonate is a matter on which opinion is divided. From some experiments carried out in my laboratory by Dr. Goldblatt, it would appear that the use of alkali, at any rate in large doses, is definitely contraindicated in diabetic coma. Goldblatt induced a ketosis in himself by starving for forty-eight hours. At this stage the urine contained fairly large amounts of acetone and diacetic acid, as indicated by Rothera's reaction and the ferric chloride test. This ketosis rapidly disappeared after taking some glucose. Careful observation showed that after the ingestion of 50 grams of glucose dissolved in water the ketosis disappeared entirely in almost exactly one hour. When, in addition to the glucose, a large dose of sodium bicarbonate was also taken, the ketosis persisted for a long time, and was still present in definite amounts after eight hours. Many experiments of a similar kind were carried out, both on man and on animals; the results were always the same, and tended to show quite conclusively that sodium bicarbonate administered in the course of an acidosis markedly prolonged the condition. In the light of these experiments there can be little doubt that the ingestion of large doses of alkali during diabetic coma tends to hinder the disappearance of the coma. Sodium bicarbonate should, therefore, not be given when treating coma by insulin, since it does no good and definitely retards recovery.

Insulin Treatment and the Persistence of Glycosuria.

It might be thought that the results of insulin therapy in any given patient would depend on keeping the blood sugar normal and the urine free from sugar. Experience shows quite definitely that this is not always so. While it is good practice in all cases to endeavour to render the patient aglycosuric, yet it may sometimes be impossible to do so without having recourse to very frequent injections of insulin. In my experience patients whose blood sugar was kept within normal limits at all times, and whose urines were constantly free from sugar, did no better than others whose blood sugar could not be always kept low. In the case of a small boy under my care it was quite impossible to control the blood sugar and glycosuria, for this patient had a real genius in the way of procuring all sorts of prohibited food. While in hospital it was almost impossible to regulate his diet, and after going out he was entirely beyond control. His urine nearly always contained a large amount of sugar—sometimes a very large amount—which generally depended on liberal supplies of chocolate which he bribed his young friends to procure for him. He seemed a quite hopeless case, and I must admit that I anticipated disaster, yet in spite of all he has done quite well and is now well developed, vigorous, and healthy. Indeed, the result in the case of this young patient makes one wonder whether certain of our theories connected with the treatment of diabetes are sound. Certainly it is best to keep the urine free from sugar, and the blood sugar as near the normal as possible, but the medical man need not despair if he finds this ideal difficult. Many patients do exceedingly well even when some glycosuria is more or less constantly present.

The Administration of Insulin.

Insulin is usually given twice daily—in the morning before breakfast and at night before the evening meal. In some patients two doses are not sufficient to keep the blood sugar within normal limits, and the question arises whether in such cases we are justified in giving three or more injections. I am quite definitely convinced that the injection of more than two doses usually does more harm than good. Though frequent injections may control the glycosuria, the mental effect is so disturbing that many patients cannot stand it. There is a feeling that they can never get away from injections for any period of time, and they sometimes suffer from a definite nervous condition. I have seen a patient in a hopeless condition of nervous dread as the result of the administration of insulin three times a day; all the symptoms disappeared when the patient was put on two daily injections.

Diet and Insulin.

There is no doubt that the effect of insulin therapy is largely dependent on the balancing of the insulin dosage with the diet. Experience, however, shows that, provided sufficient insulin is taken, there are fairly wide limits of

diet between which the patient can live and thrive. Many of our accepted ideas with regard to diet are theoretical, and do not always work out well in actual practice. When sufficient insulin is given it is quite possible for a patient to get along satisfactorily without weighing his food. Patients who are feeling fit as the result of insulin treatment are usually engaged in some business or manual labour and cannot be expected to carry a balance about with them. Indeed, it is seldom, if ever, necessary to weigh the food constantly if the patient is at all intelligent. All that is required is to teach the patient to observe how much food is represented by a definite weight. After a very little practice he is able to select and gauge his diet with ease. The average patient very soon learns to eat approximately the same amount of food each day without weighing it, and I am beginning to think that the added comfort induced by this method results in the patient being in better condition than is the case when his food is scrupulously weighed out for him. The simpler we make all the arrangements connected with insulin therapy the better results we obtain, provided that the main principles are always kept in view.

On the whole, insulin can, in general, control the symptoms of diabetes in uncomplicated cases. There are drawbacks to its use, but when judiciously administered it usually results in restoring the patient to a satisfactory state of health. This is especially so when insulin is used at an early stage of diabetes. So far no substitute has been discovered which can be taken by the mouth. None of the pancreatic mouth preparations at present on the market appear to have the slightest effect on the disease, in spite of the claims constantly advanced on their behalf. Dr. Fuller, who recently carried out an investigation on this point in my laboratory, came to the conclusion that there was no evidence of any action on carbohydrate metabolism as the result of taking these preparations.

The latest mouth preparation is a synthetic product called "synthalin." There can be no doubt that this substance when taken by the mouth does produce a definite effect in certain cases of diabetes. The glycosuria is lessened and the ketosis is often markedly reduced. The product, however, has marked toxic properties, and tends to produce gastro-intestinal and other disturbances, so that its use in the treatment of diabetes is at present not practical. It is conceivable that some preparation of a somewhat similar constitution may be found which will have a similar action without the toxic effects of synthalin. Meanwhile we must accept the view that, for the present, the only useful substance in the treatment of diabetes is insulin.

STATISTICAL EVIDENCE OF THE VALUE OF INSULIN.*

BY

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WHEN we are dealing with a chronic disease we cannot come to a true knowledge of the prognosis merely by observation in the clinic. As regards diabetes, we have all seen in the old days how many patients died from coma, and in this respect we have obtained a certain knowledge of prognosis; but full knowledge can only come from following up in a systematic way a sufficient number of unselected cases. Very few investigations of that kind have been made; I know of only two—one by Horace Gray in America, the other by Malmnos, using the material from my clinic. Malmnos dealt only with patients after at least five years had passed since they were first treated in the clinic. The results of this investigation were bad; 70 per cent. of cases showing a fasting blood sugar value of 0.18 per cent. on admission ended fatally. The interest of these investigations is the greater because the doors to the country where we could get knowledge of this kind are now closed and no human force can open them; they were closed by the discovery of insulin, and the noble way in which our colleagues in Toronto have given the fruits of the discovery to the whole world.

It will in time be of the greatest interest to compare the corresponding figures of the insulin period, but the time for this is not yet ripe. Professor Maclean has given us his statistics for four years of the insulin epoch, and we must thankfully recognize that the figures speak for a very hopeful view on the prognosis of this disease; only the future, however, can give us the definite answer.

In the figures I am giving here of my cases during the insulin epoch I am for the present dealing only with cases which were admitted to the clinic with a clear picture of coma.

Seventy-three Attacks of Coma in 57 Cases (May, 1923, to July, 1927).

Year.	No. of Cases.	Living.	Fatal Issue.		
			In Coma.		Other Diseases.
			In Hospital.	At Home.	
1923	10	6	—	—	4 (3 tuberculosis)
1924	15	9	1	4	1
1925	10	10	—	—	—
1926	17	14	1	—	2 (sepsis)
1927	5	3	2 (?1)	—	—
Total ...	57	42	4 (?3)	4	7

Analysing the cases of death in coma in the clinic, we find that in 1924 we had not formulated our present rules for treatment, and the patient who died in that year was treated with too small doses of insulin. The 1926 case and one of the 1927 cases were patients who had refused insulin treatment in the clinic earlier in the illness; in the other 1927 case the necropsy revealed a broncho-pneumonia which the pathologist considered to be antecedent to the coma.

With regard to the treatment of coma, it is my rule to try to bring down the blood sugar to a normal value in a very short time—twelve hours at longest, preferably in six or eight; in my opinion it is unnecessary to wait for the report on the blood sugar before giving a further dose of insulin; if the respiration continues to be increased a fresh dose of insulin may be given after half an hour's interval.

As to diet, I agree with Joslin and give the same diet as in other cases of grave diabetes; consequently I give no glucose. Campbell in Toronto originally spoke in favour of large intravenous injections of glucose; I am glad to see that in his later publication he has abandoned this treatment and says nothing more about it. The following table gives the dates of the latest information about my cases.

For the 42 living cases the latest information is:

From June, 1927	9	cases
,, May, 1927	17	,,
,, April, 1927	6	,,
,, March, 1927	6	,,
,, February, 1927	4	,,

For comparison I give the corresponding figures of Joslin's cases from his latest publication.

Joslin's Cases: Sixty-three Attacks of Coma in 57 Cases (April, 1923, to February, 1927).

Year.	No. of Cases.	Living.	Fatal Issue.		
			In Coma.		Other Diseases.
			In Hospital.	At Home.	
1923	11	8	2	1	—
1924	18	13	—	—	5
1925	14	12	—	—	2
1926	17	16	—	—	1
1927	3	2	1	—	—
Total ...	57* (63)	45* (51)	3	1	8

* Communicated to the Section of Medicine at the Annual Meeting of the British Medical Association at Edinburgh in a discussion on the results of insulin therapy in diabetes mellitus. News of Professor Petrén's recent death reaches us as we go to press with his paper.

* Joslin has not made a distinction between the number of attacks and the number of cases. I have had some difficulty therefore, and I hope I have made no mistake in quoting his figures.

For Joslin's 45 living cases the latest information is:

From February-April, 1926	... ...	4 cases
,, June-July, 1926	... ...	9 ,,
,, September-October, 1926	... ...	7 ,,
,, November, 1926	... ...	9 ,,
,, December, 1926	... ...	4 ,,
,, January, 1927	... ...	6 ,,
,, February, 1927	... ...	9 ,,
,, March, 1927	... ...	3 ,,
		45* (51)

It will be seen that Joslin's results—I am very glad to recognize it—are a little better than mine. On the other hand, his information from his patients is in part not so recent as mine; I hope that later information will not raise the number of his fatal cases.

That so many of our coma patients are still living is very creditable to them; the great majority are under observation in the out-patient department, and we know that they follow the advice given concerning diet very carefully. If we have deserved some credit for the result it is because we have used our influence in educating them, and the patients have understood that it was best for them to follow our advice.

A short time ago Dr. de Jong of Leyden sent me the figures of the mortality from diabetes in Holland during recent years; he had recently told me that there had been a great increase in the mortality from this disease. The figures, however, show, when divided into age groups, that the curve for the mortality for all ages below 50 takes a quite horizontal course; for the age period 50 to 64 also the curve shows no very evident rise, but for the years after 64 the number of deaths from diabetes has increased during the years 1911 to 1926 about 200 to 300 per cent. It is quite evident that the enormous difference shown for the years 1911 to 1926 must be due to the attention now given to diabetes and the development of a more accurate diagnosis as to the cause of death in patients dying at a late age. This is the opinion that I have defended for many years to explain all those statistical differences which appear to indicate that the disease is increasing in frequency.

CLASSIFICATION OF GLYCOSURIA FROM THE POINT OF VIEW OF INSULIN TREATMENT.*

BY

P. J. CAMMIDGE, M.D.

MOST observers, including Banting (Nobel Lecture, 1925), are now agreed that, as I predicted on theoretical grounds in 1922, insulin is not a cure for diabetes. It is true that many diabetic patients exhibit a considerable recovery of carbohydrate tolerance after treatment with insulin, but similar recovery occurred as a result of the "fasting" treatment, and the cause is probably the same—namely, the physiological rest provided for an exhausted function; in the one case by vicariously performing its work, and in the other by reducing the demands upon it to a minimum. There is, however, the important difference that in the fasting treatment "the horse is starving while the grass is growing," whereas with insulin the patient can be fed; but as the rest obtained by regulated fasting is not confined to the structures directly concerned in carbohydrate metabolism and has a beneficial influence in other directions, maybe helping to eliminate the cause of the disease, the full diet possible from the commencement of treatment with insulin is not always a real advantage to the patient.

In suitable cases, and used intelligently in conjunction with careful dieting and other forms of treatment, there can be no doubt that insulin is invaluable in diabetes mellitus. This is clearly evident in my own statistics, for in a series (Table I) of 250 unselected cases of which I have complete records during three years immediately preceding the discovery of insulin there were 66 deaths (26 per cent.), while in the same number of cases treated in three years after the introduction of insulin there were only 26 deaths (10 per cent.). The improvement was accounted for mainly by a complete disappearance of pneumonia, influenza, and post-operative fatalities as causes of death, and by a reduction in the number of deaths attributed to coma from 19 to 5 during the insulin period.

TABLE I.

	Pre-insulin Period.			Insulin Period.		
	Cases.	Deaths	Percentage.	Cases.	Deaths	Percentage.
Defective utilization (achriatic)	115	56	49	97	20	21
Defective storage (anapothectic)	117	10	9	138	6	4
Lowered threshold (epithyric)	18	0	0	15	0	0
Total	250	66	26	250	26	10

For purposes of comparison and treatment cases of glycosuria may be divided into three main groups, irrespective of any theory as to the cause of diabetes, by relatively simple tests. (1) Those where there is defective utilization and defective storage of sugar, or, briefly, the "achriatic" variety (a = absence of, $\chi\rho\epsilon\iota a$ = use), characterized by a high blood sugar and a low lactic acid content of the blood in a fasting condition. (2) Those where there is difficulty in storage but no obvious defect of utilization, the "anapothectic" variety (a = absence of, $\dot{a}\pi o\theta\acute{\eta}\kappa\eta$ = storehouse), in which the fasting blood sugar and lactic acid are normal, although hyperglycaemia develops on feeding. (3) Those where the utilization and storage of sugar are normally carried out and the sugar content of the blood is not high, even after a test meal of glucose, but glycosuria occurs on feeding, from unusual permeability of the kidneys for sugar, which may be termed the "epithyric" variety ($\dot{\epsilon}\pi\acute{\iota}$ = upon, $\theta\acute{\upsilon}\rho a$ = a door). It is instructive to see how the introduction of insulin has affected the death rate of each group. As might be expected, achriatic glycosuria was a much more fatal condition than the anapothectic variety in pre-insulin days, the death rate in my cases working out at 49 per cent. in the one group and 9 per cent. in the other. After insulin became available the percentage of deaths in the achriatic group fell to 21, and in the anapothectic group to 4, so that, although insulin effected a noteworthy saving of life in both, the relative mortality remained practically unchanged.

It is true that all my patients since 1923 have not been treated with insulin, for I have always maintained that the inconveniences necessarily attending its use are not compensated by the advantage gained, except where a suitable diet is not otherwise obtainable, and I think my results support this view. The twofold power possessed by insulin of promoting the storage and the utilization of sugar should render it particularly useful in cases of achriatic glycosuria, where both functions are at fault, and I found it necessary to prescribe it in 64 out of 97 (66 per cent.) of the cases of that type coming under my care in the period under review (Table II). Of these 14 (22 per cent.) have died, 2 of coma, which developed shortly after the injections were discontinued contrary to my advice, 2 apparently from the effects of insulin, but in the remaining 10 death

TABLE II.—*Insulin Period.*

	Diet.			Insulin.		
	Cases.	Deaths	Percentage.	Cases.	Deaths	Percentage.
Defective utilization (achriatic)	33	6	18	64	14	22
Defective storage (anapothectic)	131	6	5	7	0	0
Lowered threshold (epithyric)	15	0	0	0	0	0
Total	179	12	7	71	14	20

* One of the papers read in opening a discussion on insulin therapy in diabetes mellitus at the Annual Meeting of the British Medical Association, Edinburgh, 1927.

occurred from causes not directly connected with defective carbohydrate metabolism, such as cancer, tuberculosis, and nephritis. There were 6 deaths in the 33 cases of achriatic glycosuria not treated with insulin (18 per cent.), 3 were due to coma occurring in patients who refused the injections, and the other 3 resulted from cancer, nephritis, and old age respectively, causes which could not have been prevented by insulin.

In my experience patients suffering from glycosuria arising from defective storage rarely need insulin, and I have found it necessary in only 8 out of 138 cases (6 per cent.). Seven of these improved rapidly and their condition has remained satisfactory, but one who refused the treatment died of coma. This patient accounts for one of the 6 deaths in the anapothectic group not treated with insulin, where there was a total death rate of 5 per cent.; all the other patients died from causes not susceptible to the influence of insulin. (Table III.)

TABLE III.—*Causes of Death, Insulin Period.*

	Achriatic.		Anapothectic.		Total.
	Diet.	Insulin.	Diet.	Insulin.	
Accident	0	1	0	0	1
Age	1	0	2	0	3
Carbuncle	0	1	0	0	1
Graves's disease	0	1	0	0	1
Insulinism	0	2	0	0	2
Malignant disease... ...	1	2	2	0	5
Nephritis	1	1	0	0	2
Pancreatitis...	0	3	0	0	3
Refused treatment ...	3	2	1	0	6
Tuberculosis	0	1	1	0	2
	6	14	6	0	26

Epithyric glycosuria is not a fatal condition, and, since there is no defect of carbohydrate metabolism, treatment with insulin is not called for; in fact it is contraindicated, as a disturbance in the balance between the internal secretions of the ductless glands which may cause serious or even fatal hypoglycaemia results.

The effects of insulin upon the activities of the ductless glands have not received the attention they deserve. The acute symptoms arising from a large overdose are well known, but the results of chronic hyperinsulinism from therapeutic doses are, as yet, almost unrecognized, although they are of considerable practical importance. The most common is polyuria, due probably to the neutralizing effect of insulin upon the internal secretion of the pituitary; this may develop occasionally into a condition closely resembling diabetes insipidus. Conversely a partial chemical neutralization of the injected insulin by the pituitary secretion, with a compensatory hyperactivity of the suprarenals, thyroid, and parathyroids, appears to explain to some extent the varying effect of the same dose on carbohydrate metabolism in different cases and in the same case at different times, which is often so puzzling. Occasionally patients are met with in whom insulin has comparatively little effect on the hyperglycaemia unless very large doses are given, and if these are continued hypoglycaemia suddenly develops, probably owing to exhaustion of the pituitary and overstimulation of the suprarenals, with consequent asthenia. Two of my patients died from rapid heart failure, probably brought about in this way, and in three others where death was attributed to "pancreatitis" the symptoms were of a similar character, but associated with acute abdominal pain. It is important to realize that, although injected insulin may be chemically as efficient as the internal secretion of the pancreas, it is not physiologically equivalent, and the larger the dose the greater is the difference between the artificial and the natural condition which results, with consequently increasing risk of disturbances like those I have mentioned developing. In the acute diabetes of children and young adults there is some justification for comparatively large doses of insulin being given, at least for some time, if constant supervision is possible, but in chronic cases, and especially when the patient is over 25 or 30, they are not necessary, and, in my opinion, entail needless risks. I usually aim at restricting the dose to an amount sufficient to protect the patient from ketosis and enable him to metabolize 60 or 70 grams of carbohydrate a day, irrespective of whether sugar is passed in the urine or not. This plan appears to work satisfactorily, and I have cases where as much as 50 or 60 grams of sugar have been excreted daily for several years without any apparent ill effect. In some instances I give a preparation of insulin by the mouth, for, although this does not improve sugar utilization, I have experimental and clinical evidence that it may materially assist the storage of carbohydrate, so that, alone in anapothectic glycosuria or in conjunction with small injections of insulin in the milder forms of achriatic glycosuria, it is a useful method of treatment if its limitations are borne in mind. Dried preparations of pancreas containing the active digestive ferments, given by the mouth, are also useful in some cases, particularly when analysis of the faeces shows that there is defective digestion owing to sclerotic changes in the gland, or when growth and development are delayed or have ceased in children.

The most spectacular results of insulin therapy are seen in connexion with the treatment of diabetic coma. The effect is often almost magical, especially in young people, but some elderly comatose diabetics respond very little to insulin injections, and then only temporarily. The blood analyses made in my cases have shown that, as a rule, the failure of the treatment is actually more apparent than real, for the hyperglycaemia and ketosis are controlled in the usual way if appropriate doses are given, but, owing to the presence in the circulation of accumulated toxic products of defective nitrogenous metabolism upon which insulin has no effect, the coma either persists apparently unchanged or is relieved only for a time, death ultimately occurring from uraemic or amino-acid poisoning. It is therefore never wise to give too sanguine a prognosis as to the outcome of the insulin treatment unless it is certain that the coma is only a direct consequence of defective fat and carbohydrate metabolism, and is not dependent upon, or complicated by, the effects of serious renal and hepatic damage preventing the detoxication and elimination of nitrogenous waste products.

DISCUSSION.

Dr. R. D. LAWRENCE (London) agreed that the use of insulin in patients with uncomplicated diabetes could restore them to normal health and strength. In fact, it was impossible to recognize these patients as diabetics unless they were watched critically at meals or seen having injection treatment. Insulin might fail, however, to restore health in those who did not use it properly, and in cases where other organic disease was undermining the health. In infections much larger doses than usual were necessary. Dr. Lawrence had seen only one case which failed to respond to insulin, and even then it kept the patient free from coma. He had lost several coma cases in spite of energetic insulin treatment, and in all these the cause of death seemed to be an intensely depressed circulation. When the patient was pulseless, or nearly so, insulin could not be expected to act. The speaker had found it impossible to keep severe cases sugar-free continuously with only two doses of insulin a day, but rarely thought it necessary or wise to give more, since the patients did equally well on two doses and led a more comfortable existence. The only contraindication to insulin in severe diabetes was angina or cardio-vascular degeneration. Here insulin should be given with great care, and no chance of hypoglycaemia should ever be risked, as the latter was apt to precipitate an attack of angina. Dr. Lawrence had tried most of the mouth preparations advertised as being useful in diabetes, and had found them quite useless. He did not agree that senile diabetes was different from the juvenile type, and thought that Professor Maclean had produced no evidence that the difference was one of kind and not merely of degree. Moreover, the evidence on which Professor Maclean had based his condemnation of alkalis

in the treatment of coma did not seem sound. The speaker thought that small doses of sodium bicarbonate must tend to restore the diminished alkali reserve to its physiological normal, and at any rate could do no harm. He pointed out the advantage of "double strength" insulin in the case of patients who required large doses of insulin, because most practitioners were unaware of its existence. His experience with synthalin led him to believe it was of no practical value in its present form. It might be gathered from Professor Maclean's paper that there was no need to weigh the food in diabetes, whereas Dr. Lawrence considered this essential until the patient could gauge the correct quantity of food without actual weighing.

Dr. O. F. F. LEYTON (London) said that insulin did not always succeed in uncomplicated diabetes mellitus, and gave details of a few cases which had failed to react. He suggested that it was possible that the glukhormone of von Noorden was absent in these cases, and that this might account for the apparent improvement referred to by Dr. Cammidge following the administration of pancreas by the mouth. He did not agree that synthalin proved too toxic in all cases. Occasionally when a man's occupation made hypoglycaemic attacks probable if he took insulin, then synthalin might prove useful; he had seen more than one case in which this had happened. He had circularized his patients who had been on insulin, and 325 had replied; of these, insulin had been increased in 27 per cent., remained unchanged in 35 per cent., diminished in 26 per cent., and was no longer needed in 2 per cent. The diet had not remained constant; it had been increased in 33 per cent., remained the same in 62 per cent., and been diminished in 5 per cent. Some 6 per cent. of his patients had died; this was probably too low a figure, since it was difficult to trace those who did not reply. Incidental infections accounted for many patients who had to increase the insulin. True recovery occurred most frequently among patients who were treated shortly after the onset of the disease. He did not wish to be dogmatic, but would like to record the view that if patients with early acute diabetes were well fed and given enough insulin to keep the sugar in their blood below 0.15 per cent. all the time, there was a chance of true recovery.

Professor D. M. LYON (Edinburgh), as the result of examining his records, had found that of some 760 patients treated by him only about 300 had required insulin. Dieting alone had sufficed for the treatment of the remainder. There could be no doubt that careful regulation of the food intake still remained the most important factor in the treatment of diabetes. The indications for the employment of insulin were the presence of clinical acidosis or of acetonuria threatening coma; severe emaciation; a too low limit of tolerance; and failure to respond to simple dietary restriction. When the patient was first seen the decision must be taken whether he could be safely treated by dieting only, which must be carefully and conscientiously carried out by the patient. Weighing and measuring the food substances were essential at first, but later any intelligent patient could estimate the correct values at sight. The urine must be kept sugar-free at all times, and the patient's weight be maintained at a satisfactory level. Although a continuous absence of sugar was no guarantee that the blood sugar values were normal, practical experience had proved that this method of control was adequate. Experience had shown that patients taking insulin did best when the weight was not allowed to exceed the average for age and height.

Diabetes, when properly treated, was not a continuously progressive condition. Definite improvement commonly occurred, and most cases after careful treatment were able to reduce the amount of insulin or add considerably to their dietary. Many showed variability in pancreatic activity, the reason for which was not always obvious. Insulin therapy probably promoted complete arrest of the disease in many instances. It was not the case that once a patient had taken insulin it was dangerous to discontinue it. Some 33 patients in Professor Murray Lyon's series, after courses of insulin lasting two to eighteen months, had been able to give up its use for a time. In 10 of these the improvement had only been temporary, sugar returning for some cause such as toxaemia or careless dieting. The degree of recovery in some of the subjects had been so striking as to suggest that certain cases of diabetes were curable; the most striking examples had occurred in young adolescents where the condition had been of short duration. A few of the other subjects were admittedly borderline cases where the maximum insulin employed had been only 10 or 15 units, but seven patients had at one time required over 40 units daily. In one remarkable case a young woman for a long period received as much as 170 units a day, then improvement followed fairly rapidly, and eventually she was able to do without the drug altogether; she had not had any for fifteen months. This type of result suggested that the pancreas could not have been badly damaged, but that something was neutralizing both the patient's and the injected insulin. In cases where the disease advanced this was not uniformly continuous, but moved in definite stages, punctuated by intercurrent attacks of coma or infection, or by a period of dietary indiscretion. In Professor Murray Lyon's series only some ten cases belonged to this type, and it was very important to realize that the disease was not necessarily continuously progressive. Factors in the return of glycosuria included suspension of treatment or the use of a new batch of insulin weaker than usual; for some time past, however, the standardization seemed to have been entirely satisfactory and uniform. Other causes were improper feeding; "nervous" or emotional states; conditions characterized by toxaemia, such as tonsillitis, respiratory catarrhs, influenza, and various forms of sepsis; and lack of exercise. Some of these causes of glycosuria were easily recognized, and if discovered in time did little damage. The most harmful appeared to be the toxic conditions. The occurrence of an attack of coma often appeared to be followed by a reduction of tolerance. In the speaker's series of cases 47 patients had died, 7 apparently from cancer, and 5 from apoplexy; 3 were otherwise accounted for, and in 5 cases the cause of death had not been ascertained. This left 27 deaths due to diabetes, and in 10 of these the dieting was known to have been unsatisfactory. Death was preceded in the majority of the cases by coma, which was brought on by pneumonia in 5 instances, by various infections in 11, and by alimentary upset in 5. Most of these deaths did not occur in hospital. The patients who died were not necessarily the most severely diabetic, and their deaths could not have been predicted before the onset of the fatal illness.

Professor L. BLUM (Strasbourg) said that there were two indications for the use of insulin: (1) the absolute or vital, as in coma, severe acidosis, infectious disease, or surgical intervention with anaesthesia; and (2) the relative—the temporary use for a short time only in milder cases in order to give them new strength, or to cure complications such as furunculosis, eczema, pruritus, or neuritis. It was generally necessary to continue the insulin until the end of life in severe cases, or when coma had occurred. He had had three cases, however, where the coma was produced by intercurrent disease such as influenza and angina, in which it was possible to stop the insulin after a few weeks. The great danger for diabetic patients under chronic insulin treatment was infection, and particularly tuberculosis; it was essential to examine the lungs from time to time not only by the usual physical methods but by x rays. In the treatment of coma three things were necessary: (1) Sufficient doses of insulin (40 to 50 units for an injection) given intravenously every half-hour under careful and permanent supervision. In order to avoid hypoglycaemia it was necessary to watch the patient carefully during the injections; if unconscious patients showed signs of reaction (opening the eyes), or conscious patients experienced any special sensations, then the insulin had already produced an effect. Glycosuria was a sure sign that more insulin was necessary; if the urine was sugar-free there was danger of hypoglycaemia if more insulin was given. As a general rule when the patient was under clinical observation glucose was not given. (2) Lavage of the stomach. This organ often contained a great quantity of retained food; after lavage the blood pressure might rise.

(3) Medium doses of sodium bicarbonate (20 to 30 grams), to restore the sodium content of the organs and fluids, which was greatly diminished in coma. Professor Blum thought that the cardiac failure in the form of coma which he had called the cardio-vascular form of coma was partly due to the low alkali content of the organs. The use of insulin was particularly difficult in some cases of diabetes where a low hyperglycaemia (0.15 to 0.24 per cent.) co-existed with a severe acidosis, and where diabetes was complicated by nephritis with hypertension; in these latter cases the urine was sugar-free but the blood sugar was high. He had treated over 2,000 patients with insulin, but had never seen a case resistant to insulin. By increasing the dose he had always been able to reduce the hyperglycaemia, though very large doses were sometimes needed.

Dr. G. GRAHAM (London) thought that the mortality tables referred to by Professors Maclean and Petrén were rather astonishing. The tables for England and Wales showed that there had been a steady increase since 1900, and even before that year. In 1917 a big decrease occurred which was almost entirely in the deaths of persons over the age of 50. This period was coincident with the severe rationing of the war and continued until 1919. From then until 1923 the increase reappeared, but since the introduction of insulin there had been a slight decrease in the males and an increase in the females. This result was rather perplexing until the figures were examined in decades. These showed that a decrease took place in both males and females until the age of 50; after this age there was a slight decrease in the males but an increase in the females. The speaker's analysis also showed how few people died of diabetes in the early decades compared with the large number who died after 50. The decrease in the figures for the young people was quite satisfactory when the varying conditions of treatment were considered and it was remembered that insulin was still a new form of treatment. He disagreed with Professor Maclean in the distinction drawn between true diabetes and the glycosuria as seen in elderly people. The speaker believed that there was no essential difference between the condition of the elderly person with a high blood sugar and glycosuria and the young adult. The elderly person had a low sugar tolerance and the condition grew worse very slowly, but after five, ten, or fifteen years, if the patient had not died of something else meanwhile, the condition might be indistinguishable from that of a young adult. The primary action of insulin was to enable the sugar to be stored in the muscles, and this was the defect which was first seen in the patient with mild diabetes. The belief that the condition was not a true diabetes was partly responsible for poor and inefficient treatment. This was most regrettable, since the elderly person was very liable to suffer from the effects of boils, carbuncles, and gangrene of the leg. The eye complications (retinitis and cataract) were also more liable to progress if the diabetes was untreated, whereas with insulin the condition seemed to be arrested. This type of patient responded very well to treatment either by diet alone or with the assistance of insulin. A carbohydrate tolerance of 50 to 70 grams might be regained and the patient be able to give up insulin, since the condition had a tendency to improve instead of slowly getting worse. Dr. Graham believed that if patients older than 50 were treated more carefully the mortality figures would show a definite fall instead of an increase. He disagreed with Professor Maclean about the harm which alkalis could do to a comatose patient, and added that Professor Blum had shown that the tissues of the comatose patient contain very little sodium. The experiments of Dr. Goldblatt, to which Professor Maclean had referred, were made on a healthy man with a normal alkali reserve, and the large dose of alkali would produce an alkalosis. This alkalosis was the probable cause of the persistence of the ketosis after the alkali had been given. The comatose patient had a low alkali reserve, and the dose of alkali was usually insufficient to do more than make the alkali reserve normal. For these reasons the speaker did not think that reasonable doses of alkali could do any harm, but nowadays they were rarely necessary, since insulin acted so well. Professor Petrén had said that the administration of dextrose to the comatose patient did harm. If there were facilities for estimating the blood sugar it was unnecessary to give any dextrose, but if the blood sugar could not be estimated it was a wise precaution to start the active treatment with a dose of two ounces of dextrose together with 70 units of insulin.

Dr. C. G. LAMBIE (Edinburgh) said that there were many causes of glycosuria; while insulin was a specific remedy for pancreatic diabetes, its value in other conditions had not been firmly established. Some controversy had ranged around the question as to the essential difference, if any, between pancreatic diabetes in young persons and the common glycosuria of elderly individuals. Certain differences between the two types could be noted as regards their response to insulin. Thus many of the cases of glycosuria in elderly persons were remarkably resistant to insulin, a given dose producing a relatively small decrease in the output of sugar. Moreover, sudden withdrawal of even large doses of insulin might be followed by little if any acidosis, whereas in pure pancreatic diabetes the development of severe acidosis under these conditions was the rule. Administration of glucose to such patients caused the respiratory quotient to rise to levels which indicated that carbohydrate was being utilized. Further, improvement in tolerance in patients under treatment took place slowly over a long period. It seemed possible that the underlying cause of the peculiar features presented by these cases was an interference with the diffusion of glucose from the blood plasma into the tissue cells, without necessarily much interference with the utilization of glucose once it got into the cells. This was suggested by the fact that the renal threshold was often remarkably high, owing to the impermeability of the kidneys for glucose, and by the appearance of symptoms of hypoglycaemia with blood sugar concentrations sometimes much above the normal level. In such cases it was impossible to keep the blood sugar at a normal level, a relatively high concentration of sugar in the blood being necessary to bring about sufficient diffusion into the cells. The permeability of the kidneys to glucose gave a rough measure of the permeability of cells in other tissues, and in treatment it was sufficient to abolish the glycosuria or to find the dose of insulin which would be just less than sufficient to produce symptoms. Some recent experimental work by Loewi, Hausler, and Dietrich seemed to have an important bearing upon the point at issue. These workers found that hyperglycaemia, however produced—whether by glucose administration, pancreatectomy, or administration of adrenaline—caused the appearance in the blood of a dialysable substance to which they had given the rather unfortunate name of "glycaemin." This substance, when injected into rabbits, caused hyperglycaemia, and its addition to a suspension of red blood corpuscles *in vitro* inhibited the diffusion of glucose into them from the surrounding medium. If it were to be supposed that in certain individuals there was an excessive production or defective elimination of such a substance, it would seem possible to interpret many of the facts and to reconcile the conflicting views which had been expressed.

Dr. F. B. SMITH (Harrogate) agreed with Dr. Lawrence that there was a definite group of patients in whom it was impossible to restore food tolerance even with insulin; in such cases several other possibilities must be considered—namely, sepsis, disease of the thyroid or pituitary gland, malignant disease, and mental instability. He wished to draw particular attention to this last factor, as the association of mental instability with diabetes was more frequent and of greater importance than was recognized. In one of his patients, in whom anxiety neurosis was latent, acute diabetes occurred, apparently as the result of financial worry; it was satisfactorily controlled with insulin and dieting. Three years later, while constantly balanced without glycosuria, the patient became acutely and fatally maniacal. In another case markedly "temperamental" it had so far been impossible even with insulin to obtain any improvement either in tolerance for food or in the general condition. Apparently such patients possessed some substance capable of neutralizing insulin.

PULMONARY ASBESTOSIS.*

BY

W. E. COOKE, M.D., M.R.C.P.,
Director of the Pathological Department, Wigan Infirmary.

(With Special Plate.)

IN the BRITISH MEDICAL JOURNAL of July 26th, 1924 (p. 147), I published a short note on the woman who is the subject of this paper. The only similar case on record was that of a man admitted to the Charing Cross Hospital in 1899, where he died in 1900. Dr. E. L. Middleton of the Home Office kindly lent the notes of the case, and of the evidence given before the Departmental Committee on Industrial Diseases in 1906 by the late Dr. H. Montague Murray, under whose care the man had been. This patient, a man aged 33 years, had worked in the carding room of an asbestos factory for ten years prior to his admission to hospital. He informed Dr. Murray that he was the sole survivor of ten men who started work with him in the carding room; the others had died, presumably as the result of their occupation. A *post-mortem* examination was held and the diagnosis of pulmonary fibrosis was confirmed. Dr. Murray in his evidence refers to photomicrographs of lung sections which show "spicules of asbestos." These are the salient facts of the first and, down to 1924, the only record of a death due to asbestos.

That these two cases stand alone is very surprising. The asbestos industry is more than 2,000 years old, and we know that asbestos factories, up to quite recent years, have been devoid of any appliances for the prevention and extraction of dust. The remark of Dr. Murray's patient is suggestive, and medical men have long suspected asbestos dust to be the cause of lung conditions in workers in badly ventilated factories.

Asbestos is a physical paradox—a mineralogical vegetable, both fibrous and crystalline, elastic, and brittle; as capable of being carded, spun, and woven as wool, flax, or silk. A single strand can be spun to weigh less than an ounce to 100 yards, and a cloth manufactured which weighs less than 8 ounces to the square yard. It occurs in every country, but is never found in any two countries alike, nor, indeed, in any two parts of the same country.

Historical.

Asbestos is apparently indestructible, and its fire-resisting qualities were known to the ancients. The Romans mined it from the Italian Alps and the Ural Mountains. Herodotus (*circa* 450 B.C.) described a cremation cloth made from asbestos. Pliny (*circa* A.D. 50) mentions the difficulty in weaving it. Strabo (*circa* 30 B.C.) and Plutarch (*circa* A.D. 70) both speak of the wicks of the lamps of the Vestal Virgins being made from asbesta, so called because they maintained a perpetual flame without being consumed. Pausanius (*circa* A.D. 175) refers to a gold lamp made by Callimachus of Athens for Minerva, the wick of which was made of Carpasian linen, "the only linen which is not consumed by fire." Later (A.D. 1250) Marco Polo writes that he had seen Tartars using cloth that withstood fire which was made of a "Certaine Minerall of Earth found in a Mountayne."

Although its valuable properties have been known for thousands of years the modern adaptation of asbestos to the industrial arts dates from only a few years ago.

Composition.

Asbestos is one of the silicates, and its varieties are numerous. Wherever it occurs it is found associated with other minerals, more especially with chrome iron and magnetite. The composition of the well known Italian and Canadian fibres is as follows:

	Italian Fibre.	Canadian Chrysotile.
Silica	40.30	40.87
Magnesia	43.37	41.50
Ferrous oxide	0.87	2.81
Alumina	2.27	0.90
Water	13.72	13.55

The purest asbestos, having fibres of extraordinary length, occurs in Northern Italy. Asbestos may contain from 0.5 to 15 per cent. of iron oxide, but asbestos yarn is prepared from mineral as free as possible from iron. To get rid of the difficultly soluble iron, asbestos is soaked in orthophosphoric acid solution and washed in water before manufacture. The percentage of iron, then, is of recognized importance.

Manufacturing Process.

The process of manufacture resembles that of cotton. The crude mineral is subject to mechanical treatment in a grinding machine. The heavier rock is separated by gravity, and the remaining asbestos passed through carding, roving, and spinning machines, and from these to the weaving sheds.

During the carding process, and to a less extent in all the processes, a very considerable amount of dust is generated. In up-to-date factories all machines are fitted with extractor covers and the dust removed. In the first factory where the patient the subject of this paper was employed no method of dust removal was used, and the atmospheric conditions were occasionally so bad that workers in her particular room could not see each other.

Asbestos Fibre and Dust.

Microscopically asbestos fibre is seen to consist of two very different elements. The bulk of the fibre is translucent and glistening, with here and there black opaque angular particles (Fig. 1). Minute black granules also are present. These black particles are actually part of the fibre, but their appearance suggests a different chemical composition and different physical characters from the translucent portion. The dust generated during manufacture is seen to consist of these sharp angular particles and minute granules, suggesting, of course, that they are more brittle than the translucent part of the fibre. These particles are found in very small numbers in the finished article. Mr. T. H. Byrom, F.I.C., analysed several samples of dust, and found that the dusts containing the greater numbers of these black particles contained the largest amount of iron. The iron content of the finished article, raw material, and dust is as follows:

Finished article: Iron (as ferrous oxide)	0.1%
Crude raw material: Iron (as ferrous oxide)... ...	2.81%
Dust from carding room: Iron (as ferrous oxide) ...	18.4%

From these results it appears conclusive that the blackened brittle parts of the asbestos fibre are the iron-containing portions—the bugbear of the manufacturer, the cause of "dust," and a danger to the health of workers in the process of manufacture.

Clinical History of the Case.

The deceased, a woman aged 33 years, commenced work at the age of 13 years in an asbestos factory in which no provision was made for the extraction of dust. From an early age, soon after commencing work, she suffered from a cough, which did not interfere with her general health until 1917. She was then 28 years of age, and had been working thirteen years. From this time until 5 years later (1922) her attendances at work were intermittent owing to ill health. She missed occasional days and one or two periods of some weeks, until she finally ceased work in July, 1922.

Up to this she complained of cough, dyspnoea, expectoration,

DESCRIPTION OF PLATES.

FIG. 1.—Asbestos fibre, the bulk of which is translucent and in which are black angular iron-containing fragments. These constitute a large proportion of the dust generated in manufacture. (× 150.)

FIG. 2.—Large particles of asbestos in fibrotic area of lung. (× 150.)

FIG. 3.—Particle of asbestos 360 microns in length in necrotic area of lung. (× 150.)

FIGS. 4, 9, AND 12.—Curious bodies. (× 400.)

FIGS. 5, 6, 10, AND 11.—Curious bodies showing discoid arrangement and globular ends. Fig. 6 shows particles of these bodies and granular dust in a phagocytic cell. (× 1000.)

FIG. 7.—Fibrosed lung with clusters of the curious bodies lying free in alveoli.

FIG. 8.—Fibro-caseous area with giant cells.

Figs. 1 to 6 are reproduced by kind permission of the Editor of the *Journal of the Royal Microscopical Society.*

*This and the two following papers on this subject were read in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association, Edinburgh, 1927.

(Illustrating the papers by DRS. W. E. COOKE *and* STUART MCDONALD.)

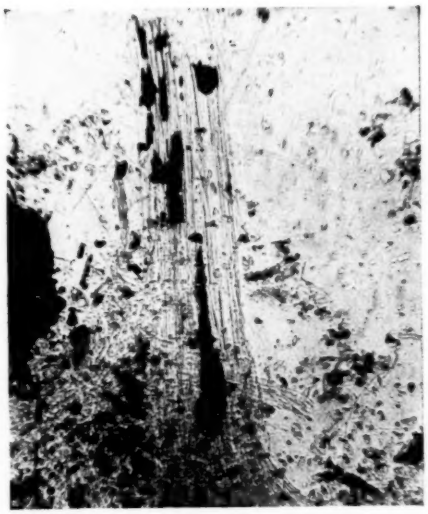

FIG. 1.

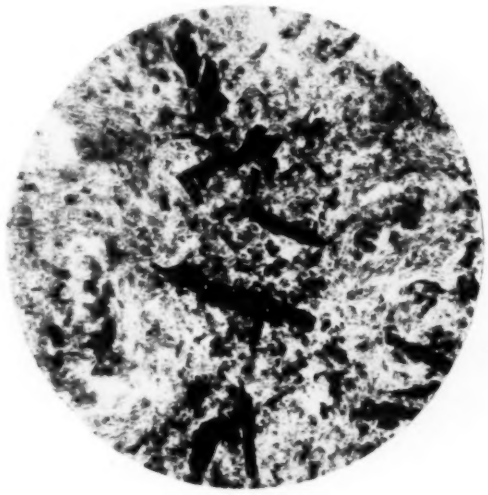

FIG. 2.

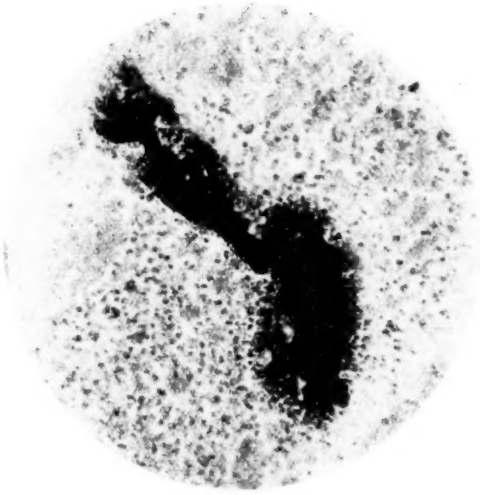

FIG. 3.

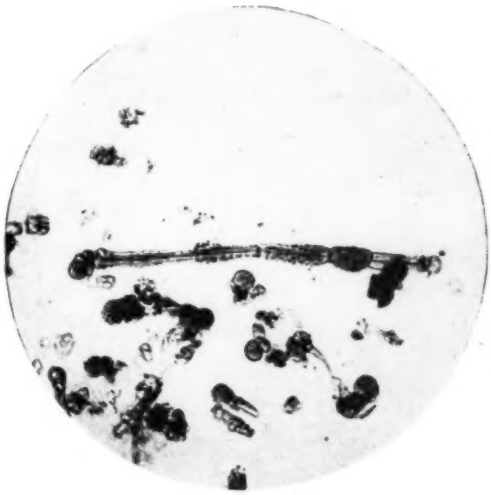

FIG. 4.

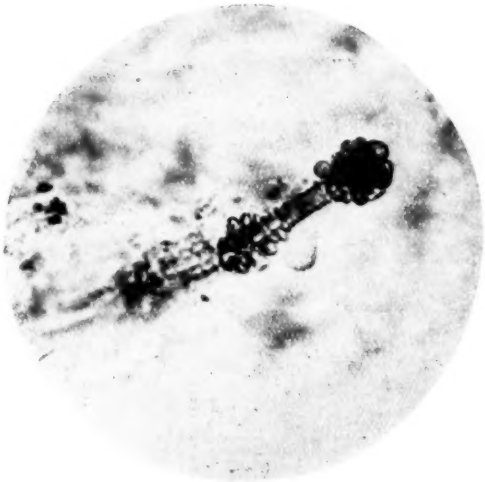

FIG. 5.

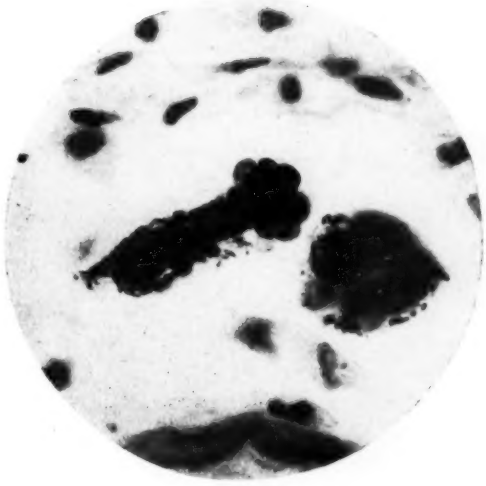

FIG. 6.

(Illustrating the papers by DRS. W. E. COOKE *and* STUART MCDONALD.)

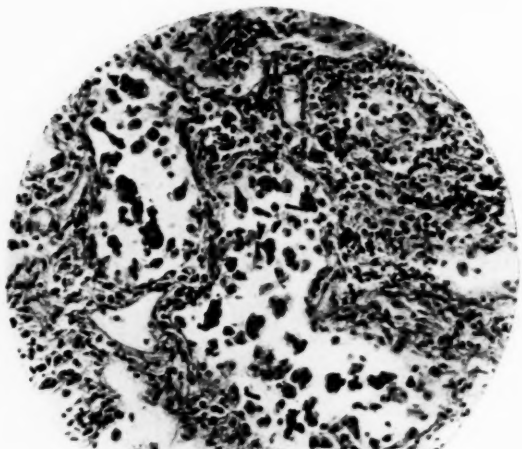

FIG. 7.

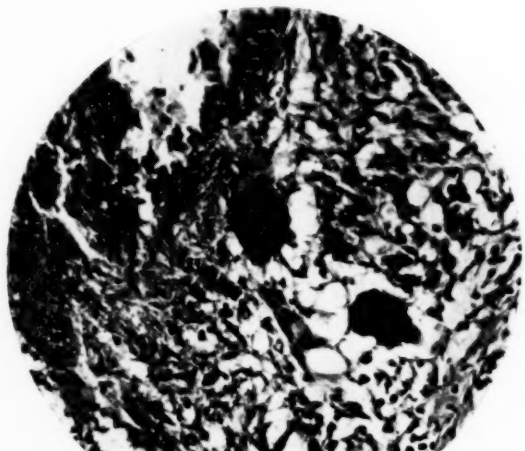

FIG. 8.

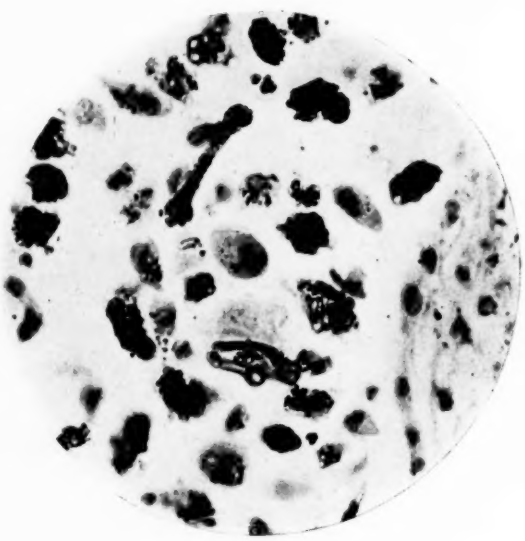

FIG. 9.

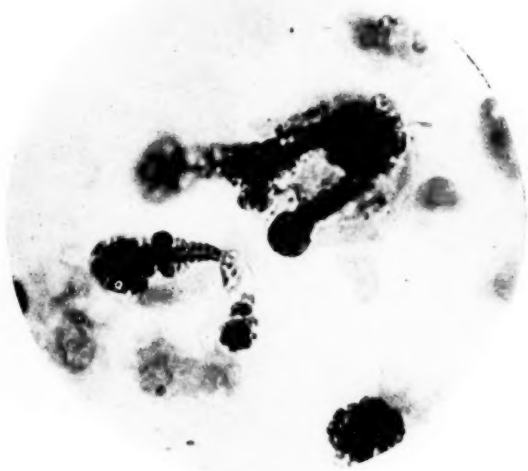

FIG. 10.

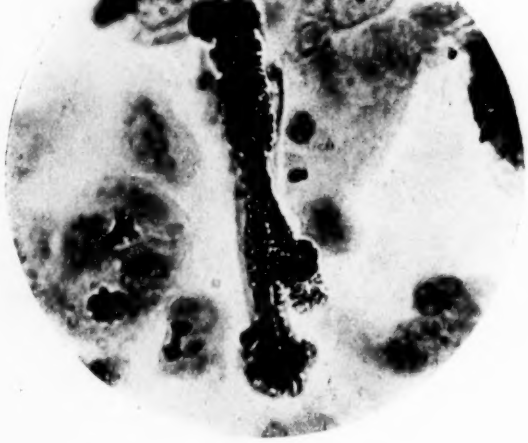

FIG. 11.

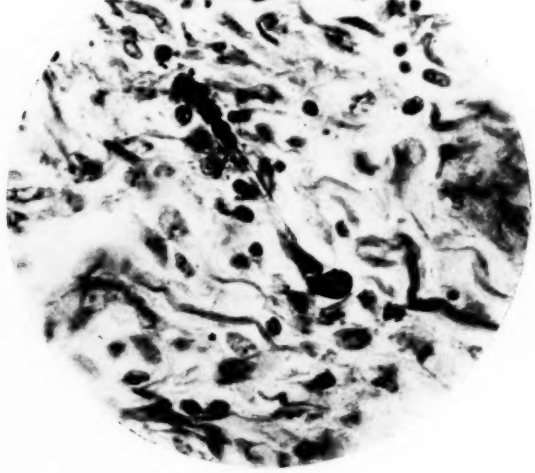

FIG. 12.

and lassitude. The physical signs in her chest were those of fibrosis of the right lung. In July, 1922, signs of cavitation were noticed, the sputum became more profuse, with sweats and irregular temperature, and she died on March 14th, 1924.

An *x*-ray plate showed extensive fibrosis, more marked in the right lung, two calcareous glands at the root of the left lung, and two small calcareous particles in the base of the left lower lobe.

Macroscopical Appearances.

Right Lung.—The pleura is thickened over the entire surface of the lung, and shows the remains of dense adhesions to the chest wall and pericardium. The lung is firm and small. The glands at the root of the lung are large, and on section are black, show a thickened capsule, and some calcareous particles. On section, the lung is seen to be fibrosed and to a large extent airless, the lung tissue being replaced by fibrous tissue. Dense strands of fibrous tissue from the pleura intersect the lung. In the apex there is a large cavity, the size of a peeled tangerine orange. The middle and lower lobes show numerous small areas—varying in size from a hazel-nut to a pin's head—of caseation, some of which have proceeded to cavitation. The bronchi are dilated.

Left Lung.—The pleura is thickened and shows the remains of adhesions to the chest wall. The thickening and adhesions are not so marked as in the right lung. The lung is firmer than normal. At the root of the lung are two large calcareous masses, one the size of a large hazel-nut, the other about half that size—calcified tuberculous glands. The other glands are black and show periadenitis. In the left apex there is an area of old scar tissue about the size of a sixpenny piece, and a cavity the size of a walnut. Scattered throughout the lung are small areas of denser consistence than the rest of the lung, some of which show definite calcareous particles, others small areas of caseation. There is a considerable increase in the fibrous tissue.

Three outstanding features are presented by sections from this case. The first is the enormous amount of fine granular pigment in the peribronchial fibrous tissue, walls of alveoli, and in phagocytes scattered through the sections. The particles of this dust are similar in size and shape to the black granules seen in the asbestos fibre.

The second unusual feature is the presence of large solid angular particles (Fig. 2). These are situated in areas of fibrosis and in caseating areas. They vary in size from 3 to 360 microns in length. The particles are so large—masses of them are seen in certain areas—that they must have occluded small bronchi. Fibrosis of the alveoli supplied has taken place and later necrosis, as seen in Fig. 3.

We have never seen anything parallel to this in pneumonoconiosis due to other dusts, nor have we been able to find such occurrence in literature. On comparing these large particles with asbestos dust there is a striking resemblance in sizes, shapes, and colour. In fact, it is very easy to take each single particle found in the lung sections and immediately find its brother in a slide made from the dust.

We cannot think there is any reasonable doubt that the particles in the lungs are the heavy, brittle, iron-containing fragments of asbestos fibre. The more extensive involvement of the right lung is thus explained. The heavy particles would pass more easily down the more vertical right bronchus than the horizontal left bronchus.

HISTOLOGY OF PULMONARY ASBESTOSIS.

BY

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(*With Special Plate.*)

My remarks are confined to the histological appearances in the lungs in this condition, with special reference to certain foreign bodies of most unusual appearance which are present both in the alveoli and interstitial substance of the lungs. The observations are based almost entirely on material supplied from the case described by Dr. Cooke. The investigation has been conducted in the pathological department of the University of Durham College of Medicine.

I may state, however, that the appearances are practically identical with those observed in a second case of this condition, sections of which I have had an opportunity of examining through the courtesy of Dr. I. M. D. Grieve of Armley, Leeds.

Histology.

Numerous sections have been made from both lungs. The changes are more marked on the right side, but the appearances in the two lungs only differ in degree. They may be summarized as follows:

1. There is well marked diffuse interstitial pneumonia with chronic bronchitis and some emphysema.
2. There is well marked anthracosis.
3. There is an extensive tuberculous condition with chronic phthisis.
4. In the alveoli, bronchi, and bronchioles, and also in the interstitial fibrotic areas, are certain foreign bodies which will be described in detail later (Fig. 7).

As this communication deals specially with the nature of the foreign bodies, the general histological features will be dealt with very briefly.

The interstitial fibrosis is such as might be expected as a result of a combination of a pneumonoconiotic condition and a chronic tuberculous infection. The typical whorled formations seen in a more purely silicotic condition are not present. There is a marked endarteritis in the smaller branches of the pulmonary arteries; some are thrombosed and organized. Many of the smaller bronchi are obliterated; some have still caseous-looking centres. Some of the alveoli show the usual metaplasia of their lining cells into cuboidal form. The fibrosed and thickened walls of the bronchi in many places gradually merge into the areas of diffuse fibrous overgrowth. There are numerous foci of lymphocytic cells among the fibroblasts. Some of these seem obviously derived from lymphoid tissue in the bronchial walls. The interstitial fibrosis is progressive. The tuberculous condition is obvious histologically. Tubercle bacilli were not detected, but the histology is characteristic. The lesions are chronic in character, and there is no special indication of an acute exacerbation. There is well marked caseous bronchitis with lymphatic spread and numerous fibro-caseous deposits with giant cell systems (see Fig. 8). The bronchi, which are not specially the seat of tuberculous change, show catarrh with peribronchial thickening. There are numerous emphysematous areas. The alveoli show, in the majority of cases, some thickening of their walls, and contain many catarrhal cells, apparently derived from the lining cells; a similar catarrhal change is seen in the terminal bronchioles, some of which are dilated.

The Foreign Bodies.

The larger black and irregularly fragmented bodies which have been described by Dr. Cooke were not very obvious in the material I examined, but were clearly seen in some microscopical preparations of his which I had the opportunity of examining. I shall not refer to them specially, but confine my attention to certain highly characteristic and much smaller bodies which are abundant in all the sections examined. Some of these are free, but many are phagocytosed by the large mononuclear cells in the alveoli (Fig. 5). Some are easily included in comparatively small phagocytic cells, but the majority are larger, varying in size from 20 μ to 70 μ, or even more in the case of certain elongated forms. The smaller bodies are rounded and homogeneous, and all have a distinct yellowish-brown colour suggesting blood pigment. The longer forms have a highly characteristic appearance, strongly suggestive of some organic structure. Most have an annular appearance, which on closer examination can be resolved into a closely set series of rounded discoid bodies (Figs. 4, 5, 10, and 11). In some cases the globular forms are arranged along the more filamentous forms and occasionally are clustered at the ends of the rods, simulating sporangia of a hyphomycetes (Figs. 5, 6, 10, and 11). Some have club-like extremities at one or both ends of the filaments. Others, again, suggest the appearance of minute crustacean forms (Fig. 10), but closer examination does not support the idea of either vegetable or animal origin. These bodies do not stain with the ordinary aniline stains, but preserve their original yellow-brown colour. They are seen well in unstained sections. They give a characteristic prussian-blue reaction with potassium ferrocyanide and dilute hydrochloric acid. The reaction is not so obvious unless the solutions are slightly warmed. Where the bodies are too large to be phagocytosed by individual cells they tend to become surrounded by plasmodial masses. Many of the phagocytes contain much carbon pigment in addition. Though these bodies are mainly found in the alveoli and

infundibular passages, they are also present in the caseous areas, in the neighbourhood of the phthisical cavities, and some can be demonstrated in the fibrotic areas surrounded by definite fibroblasts. One in particular (see Fig. 12) measured about 75 μ. It is clear and segmented in its middle part, but the extremities are nodular and clubbed. It is difficult to imagine that a foreign body of such length could be transported by phagocytes, but they may represent larger bodies left in a bronchus which has become obliterated. The bodies have been examined with the micro-spectroscope, but so far no clue as to their nature has been obtained by this means. They are not refractile by polarized light.

Nature of the Bodies.

We have shown these preparations to several pathologists, but the appearances are new to them. To confirm our own opinion we have submitted them to experts in zoology, who are unanimous that they are not of animal nature. We have also submitted them to botanical and chemical authorities, and though there has been a considerable difference of opinion, some regarding them as hyphomycetes, the general opinion has been that they are not vegetable forms.

The fact that exactly similar bodies have been found in the lungs of another asbestos worker, and, so far as I can ascertain, have not been found elsewhere, would seem to indicate that they are essentially derived from or associated in some way with the asbestos itself. It is also certain that they do not in any way resemble concretions, largely composed of calcium and other salts, and also containing iron derived from blood, such as have been described as streptothrix forms in the spleen, and which may closely simulate mycelial filaments. The hypothesis advanced is that these bodies are portions of asbestos fibres in the process of alteration and absorption by hydrolysis, either by direct chemical action or by enzymes. The particular variety of asbestos with which this patient worked was a Canadian serpentine (chrysotile). It would probably contain silica and a magnesium salt in about equal proportions (40 per cent.) with up to 3 per cent. ferrous oxide, 1 per cent. of alumina, and water. From its high resistance to heat we are apt to regard asbestos as indestructible, but, given time, it is possible for hydrolysis of such silicates to occur, even in pure water. Such hydrolysis would be hastened and intensified by the presence of CO_2 in the pulmonary alveoli, and the warm moist atmosphere there would, no doubt, accelerate the process. Even under these conditions the process would necessarily be a slow one. The magnesium could be separated out as relatively insoluble carbonate, or more soluble bicarbonate, which in turn would be converted into any other salt for which there happened to be the appropriate acid available.

The iron existing in a ferrous condition in the presence of an oxidizing agent might be converted into the ferric state, and subsequently precipitated as hydroxide. The silica might pass into a colloidal state, at first in sol form (orthosilicic acid), later passing into a gel (metasilicic acid). If this were so in sol form, it would tend to remain associated with the surface of the asbestos fibre by adsorption, and might be held there till it became a gel. In time the gel might adsorb the solution, and so gradual conversion of the fibre into a mass of gel would occur. There might be in the tissues sufficient albuminoid material to effect rapid gelatinization of the sol, particularly if, as would be the case here, the sol was being slowly produced. The fact that the gel is of high surface tension, and formed at an irregular rate, would give it a spheroidal structure and account for some of the appearances seen here. Whether this be the exact explanation or no, it is at least an hypothesis which should be capable of experimental verification. As has been held by Gye and others, in cases of silicosis there may be a direct chemical action of silica on the tissues apart from the merely mechanical irritation of the particles, with the production of fibrosis. Orthosilicic acid is, as has been shown, an active poison, but rapid conversion into metasilicic acid would minimize its action.

As to the relative part played by the asbestos and the tuberculous infection in this case, in relation to the fibrotic change, it is difficult to say, but it is a reasonable assumption that the tuberculosis was a superadded infection, and in Dr. Grieves's case referred to above there was in the sections examined a considerable degree of fibrosis without apparent tuberculosis. The immediate cause of death in that case was a terminal broncho-pneumonia. Till some experimental work is completed the exact nature of these foreign bodies must remain in doubt, but their highly characteristic appearance may well prove to be an important diagnostic point in the recognition of the lung of a worker in asbestos.

I am much indebted to Dr. Cooke for material from his case, to Dr. Grieve for an opportunity of examining his microscopical sections, to P. L. Robinson, D.Sc., of the Chemical Department, Armstrong College, for his advice and suggestions on the chemistry of the silicates, and to Professor W. H. Lang, F.R.S., of Manchester, for a reasoned opinion as to the non-botanical nature of the foreign bodies.

CLINICAL ASPECTS OF PULMONARY ASBESTOSIS.

BY

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DR. W. E. COOKE has given a short account of the history of asbestos, also of the processes of its manufacture into cloth-like structures much in the same manner as raw cotton fibre is woven. He has told us that in the carding department a considerable quantity of dust is evolved. The crushing of the rock is not carried on to any extent in this country; this is usually done in the countries where the mineral is quarried. Canadian rock is crushed in Canada so as to reduce the expense of transport to Great Britain. Our workers are therefore less exposed to the harmful influence of the dust—a fortunate circumstance, since the rock frequently contains as much as from 50 to 60 per cent. or more of silica.

With the exception of Dr. Cooke's paper on pulmonary asbestosis published in 1924, and the details of a fatal case published by Dr. Montague Murray in the *Charing Cross Hospital Gazette* in 1900, there has not been, to my knowledge, anything written in this country upon the subject. I have had, however, the opportunity of visiting asbestos factories in America, and of seeing cases of pulmonary asbestosis through the kindness of Drs. Haddow and Grieve of Armley, Leeds. It may, I think, be safely said that there must have been several deaths of workers in British factories from the malady, but as no autopsy and microscopical examinations of the lungs were made the deaths were probably certified as pulmonary tuberculosis.

Asbestos manufacture is largely a familial occupation. It has been carried on in this country only for a little over thirty years. Carding and spinning of the fibre are important processes in the manufacture of asbestos goods. In these departments many women are employed, mothers being succeeded by their daughters. Where ventilation of the carding and spinning rooms is properly attended to the atmosphere is fairly clear of dust and floating fibre, otherwise in these operations considerable quantities of dust become suspended in the atmosphere. In a British factory the dustiest process is "hand beating" of the finished mattresses used for covering and protecting the internal machinery of automobiles. This work should only be undertaken in a room separated from the main parts of the factory, with open windows at one end and strong down-draughts at the other, but even with this precaution men working therein should wear masks.

Recently, with Dr. Grieve of Armley, I examined two women who are the subjects of pulmonary asbestosis, one aged 48 and the other 39. The older patient was one of the first to commence work thirty years ago in the particular factory I visited. At that date no danger from dust was anticipated, so that no effective ventilation of the workrooms was attempted, such as prevails to-day. Although only 48 the first patient mentioned looks older by several years, and is extremely emaciated. She gave up work a year ago on account of increasing physical

debility, shortness of breath, and cough. At present she has no expectoration; her respiratory capacity is one inch. Although the apices of both lungs in front are resonant, there is distinct flattening of the percussion note at the bases. The respiratory murmur at the apices and mid-lung is coarser than usual, and the expiratory murmur is prolonged. At the right base the respiratory murmur is feeble, and small dry friction sound is heard. Towards the base of the left lung and extending into the axilla are heard small moist tinkling sounds, suggestive of cavitation having taken place; here also small friction sounds can be heard. Similar physical signs prevail posteriorly. The apex beat of the heart is displaced upwards and outwards; it is felt external to the nipple, a circumstance which, combined with marked accentuation of the second sound of the heart heard over the pulmonary artery, suggests that fibrotic changes have already occurred in this lung. Although the patient states that she has no expectoration, this was present six weeks ago, and when examined was found to be free of tubercle bacilli. There is no enlargement of the external glands.

The other patient, aged 39, has been an asbestos worker for eighteen years. She had no illness until four years ago, when she developed cough and attacks resembling bronchial asthma. After remaining away from the factory for three months she returned to her employment, and followed the occupation for three years, when she married, and as in the early months of her pregnancy she lost considerably in weight she retired from the factory. Although reduced considerably in weight, and the subject of cough all through her pregnancy, her infant daughter, who is 14 months old, is healthy and well developed.

The patient complains of a dragging in the chest without actual pain. There is noticeable shortness of breath on slight exertion, and she complains of morning cough with expectoration. The sputum has been examined and is negative as regards tubercle bacilli. Her appetite is poor. She weighs 8 st., a drop of 3 st. having occurred within the last two years. Her heart is healthy; the apex beat is not displaced, but the second sound over the pulmonary artery is distinctly accentuated. The apices of her lungs are resonant. Here the respiratory murmur is coarser than usual and the expiratory is prolonged, so that the inspiratory and expiratory murmurs approach each other in equality. Moist râles are heard in mid-axillae and small friction with crepitation is heard at the bases. This woman's mother, who is aged 60, is still working in the factory.

From what I have seen clinically of pulmonary asbestosis it resembles silicosis of the lungs in the marked shortness of breath on slight exertion, deficient respiratory capacity, physical debility, and, in examination of the sputa of not too far advanced cases, absence of tubercle bacilli, but since fibrotic changes are developing in both of the patients to whom I have alluded, there is almost sure to develop, if such has not already taken place, pulmonary tuberculosis.

The clinical picture of pulmonary asbestosis differs slightly from that presented by a patient the subject of ordinary tuberculosis of the lungs, in so far as there is a pronounced deadening of the skin varying from mild bronzing to slight blueness, a degree of shortness of breath in excess of the physical signs, a greater amount of general disability, little expectoration, and comparative absence of night sweats.

AN ACTIVE CONSTITUENT OF THE PREPARATION CALLED "GLUKHORMENT."

BY

H. H. DALE, C.B.E., M.D., F.R.C.P., SEC. R.S.,

AND

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IN May of this year Professor von Noorden published in the *Klinische Wochenschrift* an account of a new pancreatic preparation which had a controlling effect on carbohydrate metabolism, but, unlike insulin, was effective when administered by the mouth.[1] To this preparation the name "glukhorment" had been given, and the title of the paper made it clear that the substance was regarded by the author as containing a new anti-glycosuric principle, naturally preformed in the body. On information, evidently supplied to him by the chemist responsible for devising "glukhorment," Professor von Noorden stated explicitly that, in spite of indications in the patent specification, which might suggest some connexion of the active principle with a guanidine derivative, no such derivative, and in particular no synthalin,* had been added; and, further, that the finished preparation contained no guanidine derivative of any kind in recognizable amount. Professor von Noorden drew the cautious conclusion that, if the activity were due to a guanidine derivative, it would have to be one of extremely high activity. In July of this year one of us (H. H. D.) received a communication from the Horment Company, who were manufacturing glukhorment, stating that they were sending material in the hope that clinical trials of it could be arranged. In due course this and several subsequent consignments of glukhorment were sent by the Horment Company, with a request for their trial.

A consideration of preliminary reports, on the mode of action of this preparation on the human being and on laboratory animals, suggested a strong similarity between its effects and those with which we had become familiar, through experiments then for some time in progress, on the action of synthalin. Some of the glukhorment was immediately placed in the hands of one physician, who will presumably report his experience with it in due course. The physiological resemblance to synthalin was so pronounced, however, that, before the question of wider clinical trials was considered, it was thought desirable to make a simple chemical examination, in order to confirm the fact that the preparation was free from synthalin and similar guanidine derivatives, as stated in the paper by Professor von Noorden, of which copies had been submitted by the Horment Company in support of their request. The result of this first test showed clearly that a guanidine derivative strongly resembling synthalin was present in substantial amount in the glukhorment tablets as submitted for trial. The evidence thus early obtained was at once so clear and so surprising that it was considered desirable to use a further quantity of the material submitted, in order to obtain precise information as to the nature of the substance in question. The isolation of the substance was made easy by the fact that the nitrate of synthalin is a remarkably insoluble salt.

Chemical Isolation from Glukhorment of a Guanidine Derivative closely resembling Synthalin.

Two hundred glukhorment tablets were powdered; the powder, weighing 60 grams, was thrown into 1 litre of boiling water and the mixture was kept gently boiling for fifteen minutes. The liquid was then filtered, while still hot, from a large mass of insoluble protein.

The filtrate was evaporated *in vacuo*, with the addition of octyl alcohol to prevent frothing, to a volume of 120 c.cm. On standing, it set to a jelly; this was warmed to 40°, when it became fluid, and concentrated nitric acid was added until the reaction of the liquid was strongly acid to Congo red. A white crystalline nitrate separated from the solution on standing, and the liquid no longer set to a jelly when cold. The crystalline material was collected by centrifuging, washed in the centrifuge with a small quantity of dilute nitric acid, and dissolved in about 25 c.cm. of hot water. This solution was boiled with charcoal and filtered. To the hot filtrate 0.5 c.cm. of 6 per cent. nitric acid was added, and the nitrate crystallized on cooling. This was filtered off and dried; it weighed 1.135 grams. It was then converted into the picrate by dissolving it in water and adding a saturated solution of sodium picrate until no further precipitate was produced. The picrate was filtered

* "Synthalin" is the synthetic compound, decamethylenediguanidine, introduced by Frank, Nothmann, and Wagner, as an antidiabetic remedy for oral administration, and already the subject of numerous reports.

off, washed with water, and recrystallized from 1,200 c.cm. of boiling water: yield of recrystallized picrate 1.681 grams.

The picrate was then warmed on the water-bath with 15 c.cm. of a mixture of 75 per cent. alcohol with 25 per cent. of 5 per cent. aqueous hydrochloric acid. To the clear warm solution were added 250 c.cm. of acetone, which precipitated the hydrochloride. This was filtered off and washed with acetone and ether until free from picric acid: yield of hydrochloride 0.806 gram.

This salt was crystallized from 12 c.cm. of water and 0.2 c.cm. of concentrated hydrochloric acid: yield 0.680 gram. From this salt the picrate (fine, curved needles), the chloroaurate (thin, long rectangular plates), and the mercurichloride (prismatic needles) were prepared.

Through the courtesy of Messrs. Schering we were in possession of a specimen of Kahlbaum's pure synthalin hydrochloride. This was compared with the hydrochloride isolated from glukhorment, and the above series of salts was also prepared from Kahlbaum's specimen for comparison. Both synthalin hydrochloride and the hydrochloride isolated from glukhorment gave identical purplish red colours when tested by Sakaguchi's reaction for guanidine derivatives, and in each case the corresponding salts had identical physical properties (solubility, crystalline form, and melting point). Mixed melting point determinations showed no depressions.

	Source.	Melting Point.	Mixed Melting Point.
Hydrochloride ...	Kahlbaum's synthalin ...	202°	202°
" ...	From glukhorment ...	200°	
Picrate	Kahlbaum's synthalin ...	195–8°	195–8°
"	From glukhorment ...	195–8°	
Chloroaurate	Kahlbaum's synthalin ...	156–8°	156–8°
"	From glukhorment ...	156–8°	
Mercurichloride ...	Kahlbaum's synthalin ...	172–6°	172–6°
" ...	From glukhorment ...	172–6°	

The chloroaurates were analysed and found to contain the same percentage of gold, which, moreover, is precisely that calculated for decamethylenediguanidine (synthalin) dichloroaurate—namely, 42.1 per cent.

Chloroaurate (from Kahlbaum's synthalin): Contained no H_2O of crystallization; 0.2146 gram, dried at 102°, gave 0.0901 gram Au. Au=42.0 per cent.

Chloroaurate (from Glukhorment): Contained no H_2O of crystallization; 0.2125 gram, dried at 102°, gave 0.0894 gram Au. Au=42.1 per cent.

It will be seen from this fairly thorough chemical comparison that the substance isolated from glukhorment is indistinguishable, by the tests applied, from synthalin as prepared by Kahlbaum. It must be either identical with synthalin, or so closely related to it that an elaborate analytical investigation with large amounts of material would be required to distinguish between them. A sample from a batch of glukhorment submitted quite recently, with the suggestion that this would prove to be better than earlier batches, contains the same synthalin-like substance in about the same proportion.

Physiological Tests of the Substance Isolated from Glukhorment.

We are indebted to Mr. H. P. Marks for investigating the action of this substance on two rabbits. The animals (each weighing 2 kg.) fasted for twenty-four hours; then into (1) 20 mg. and into (2) 50 mg. of the substance, in aqueous solution, were injected subcutaneously.

Rabbit.	Blood Sugar Percentage (Hours after Injection).						
	0	1	2	3	4	5	6
(1)	0.144	0.262	0.327	0.385	0.179	0.134	0.069
(2)	0.141	0.310	0.251	0.090	0.073	—	—

Rabbit (1) developed convulsions after six hours and rabbit (2) after four hours. When in convulsions they were killed, and samples of their livers taken for glycogen determinations.

Rabbit (1) had 0.05 per cent. liver glycogen.
Rabbit (2) had 0.02 per cent. liver glycogen.

These results are closely similar to many which have been obtained in this laboratory by similar injections of synthalin into rabbits.

These experiments establish beyond question the fact that the glukhorment tablets, as issued for therapeutic use, contain either synthalin itself, or a substance so closely related to synthalin as to be indistinguishable from it, by the chemical and physiological tests applied. The information on which Professor von Noorden had based his published statement, that glukhorment contained neither synthalin nor any other guanidine derivative in recognizable amount, was clearly incorrect. Substantially more than 1 per cent. of a guanidine derivative, indistinguishable from synthalin, was easily extracted from the tablets; and it was quite certain that the process would not yield, in pure form for weighing, more than a part of what was originally present.

The point obviously had a practical interest, and we decided that it was our duty to inform Professor von Noorden of the results of our investigation, and to place at his disposal the details of our experiments.

Professor von Noorden's reply, dated November 17th, 1927, made it clear that he had already received somewhat similar information from another quarter, and that he had taken the first opportunity of making a public statement concerning the position, as thus for the first time revealed to him. At his request we give the following translation of an extract from a lecture which he delivered on November 8th in the Berliner Fortbildungsinstitut für Aerzte. He informs us that this same part of his lecture will be published in No. 23 of this year's volume of the *Zeitschrift für ärztliche Fortbildung*, about December 1st.

"The Position of the Glukhorment Question."

(Extract from a lecture delivered on November 8th, 1927, by Professor C. von Noorden.)

Concerning substitutes for insulin I will only report briefly, since nothing of a final nature can be said concerning them.

The insulin-like nature of the guanidine derivative synthalin is not contested by anyone, provided that sufficient doses are given; but the curative dose and the injurious dose lie close together; the dividing line is often indistinct, scarcely recognizable, and shows wide differences in individuals. From month to month communications concerning synthalin accumulate. The contraindications become constantly more frequent, and stronger in comparison with those in its favour. That is the position of synthalin to-day.

Concerning glukhorment you will wish to hear something more definite. You must not, however, expect to hear anything final. I reported on it at the end of May, since, already one month earlier, before the conclusion of the preliminary experiments, a communication concerning it had reached the daily press, through a deplorable indiscretion.

The favourable conclusions which I then published in the *Klinische Wochenschrift* (No. 22)[1] are based on incontestable facts. The preparations which I received at that time, and on which I remained dependent until the beginning of the actual manufacture in July, were prepared on the smallest scale, and, according to the assurance on word of honour, which I then demanded and received, were prepared by strong tryptic digestion of fresh pancreas substance for about eight days, without any kind of addition. To which part of the fermentation mixture, rich in peptides, the undoubted antiglycosuric action was attached, remained uncertain. I left the question open at that time, as to whether through the powerful tryptic digestion a very potently active guanidine derivative might have been produced.

As happens also in other departments of chemistry, the preparations obtained by the later development of manufacture on a large scale failed by far to attain the activity of those obtained in small-scale working. They satisfied neither myself nor others. When, after a long absence, I again took up the investigation a few weeks ago, I received for the first time preparations from the large-scale manufacture, which, indeed, were inferior in activity to the original ones, but were nevertheless usable. Now Wiechowski has stated a few days ago, in the Medical Union of Prague, that he has found a guanidine derivative in glukhorment, which corresponds with synthalin in important reactions and in its pharmacological properties.

As to whether it is a case of true identity or not, Wiechowski obtained no definite evidence, according to his letter to me. Assuming identity, scientific logic would present only two possibilities :

Either, in spite of assurance to the contrary, without my knowledge and against my will, the guanidine preparation known as synthalin is added to glukhorment. In that case, we should be dealing with at least a gross breach of trust in relation to myself and to the public. According to the assurance repeated to me a few days ago, on the word of honour of the responsible chemist, at no time, either earlier or recently, has synthalin been mixed with glukhorment.

Or, the remarkable fact would be presented that from the pancreas, together with other products of decomposition, a substance chemically and pharmacologically at least very similar to synthalin can be obtained—a fact which would be of great importance for the study of intermediary metabolism. I recall in this connexion that I indicated in advance, as a possibility, the formation, together with numerous other decomposition products, of a guanidine derivative of great activity, exceeding that of synthalin.

You will see that I speak quite openly. Given the identity of the two active chemical substances present in synthalin tablets and in glukhorment tablets, the decision between these two possibilities must not be a matter of impression. These are questions for experimental investigation, of which, on my part also, there shall be no lack.

We need add but little to Professor von Noorden's frank statement. This publication of our own findings is made at his explicit request, and may be regarded as a contribution to the experimental investigation which he himself indicates as imperative. The details of the work done in Professor Wiechowski's laboratory have appeared since we communicated with Professor von Noorden, and learned from him of this other investigation of glukhorment.[2] Dr. Langecker's evidence of the chemical identity or close chemical similarity with synthalin is much less convincing than that which we have been able to obtain. The physiological comparisons made in Prague are, on the other hand, more thorough than those which we thought it necessary to make. The conclusions are practically the same as our own.

Our evidence, of course, provides no means of discriminating between the two possibilities which Professor von Noorden mentions. If a substance, so different in structure as synthalin from any hitherto known to occur in the body, were produced by tryptic digestion of pancreatic tissue, the fact would obviously have an interest far beyond that of the immediate question concerning the nature of the active constituents of glukhorment. The point of practical importance, and the one which imposes upon us the necessity of publication, is that glukhorment cannot be regarded as free from synthalin, or similar guanidine derivatives. On the contrary, it contains either synthalin or a substance so closely allied as to be indistinguishable without prolonged investigation; and it contains this substance in sufficient quantity to play an important part in whatever therapeutic or other actions the preparation may possess.

It should, perhaps, be added that we are not in a position here to discuss the therapeutic value of glukhorment as such, or the possibility that the action of a substance like synthalin might be modified by the presence of the known constituents of a pancreatic digest. Our concern is to ensure that the physician, in charge of a patient who has shown intolerance to synthalin, should not be led to administer glukhorment by the mistaken supposition that it contains no synthalin or similar substance.

REFERENCES.

[1] *Klin. Woch.*, 1927, No. 22, p. 1041. [2] "Der wirksame Bestandteil des Glukhorments," Hedwig Langecker, *Klin. Woch.*, 1927, No. 47, pp. 2238, 2239.

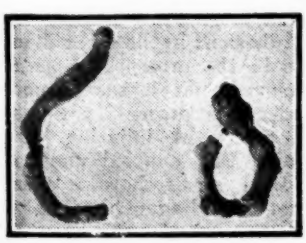
Memoranda :

MEDICAL, SURGICAL, OBSTETRICAL.

GALL-STONE FORMATION.

THE following is rather an unusual case and worth reporting.

An unmarried woman, aged 30, a cook, was operated on in hospital in 1924 for gall stones. The stones were removed and the bladder was drained. During the last year she had recurrent attacks of colic. In September, 1927, I was called, and found her in a definite attack of colic. When this had subsided I operated and removed the gall bladder. On opening it after the operation I found two stones inside, which had formed round the purse-string suture inserted at the first operation, the suture running through the whole length of the stone.



Eastbourne. E. WILSON HALL, F.R.C.S.Ed.

PREGNANCY COMPLICATED BY MITRAL STENOSIS.

THE following details of a case of pregnancy, associated with mitral stenosis and terminating fatally, appear to be worthy of record.

A woman, aged 26, who had had a normal pregnancy and labour eighteen months previously, was admitted to hospital six and a half months pregnant with malaise which had lasted for some weeks. She had had rheumatic fever as a child, and, on admission, was found to have mitral stenosis without any signs of failure of compensation. The temperature, pulse, and respirations were raised; there was some abdominal tenderness, especially over the gall-bladder region, in the left iliac fossa, and in both renal angles. The spleen was doubtfully palpable; the urine negative. On the following day her condition was obviously worse, slight albuminuria had appeared and there was oedema of the feet and back; the renal tenderness was less, and repeated examination of the lungs revealed nothing pathological. On two occasions she had syncopal attacks and nearly died; three days after admission, therefore, labour was induced by means of a prostatic catheter, no anaesthetic being employed. Delivery followed normally within six hours; a live and healthy foetus was born, but died a few hours later owing to prematurity. During the twenty-four hours following delivery the patient's condition was very much better, apart from an irritating cough which prevented sleep until heroin was given, when she had a good night. On the following morning the temperature had dropped to 96°, the patient felt better and complained only of slight nausea. At mid-day she had haematemesis, quickly followed by the passage of a quantity of blood from the rectum; two hours later she died.

At the necropsy all organs showed chronic venous congestion; there were large vegetations on the heart valves, especially the mitral, but no signs of emboli anywhere. At the junction of the middle and lower thirds of the oesophagus a small ruptured vein was found, without evidence of varicosity. About one inch of clot was drawn out from the vein and was found to be a *post-mortem* clot and not thrombus.

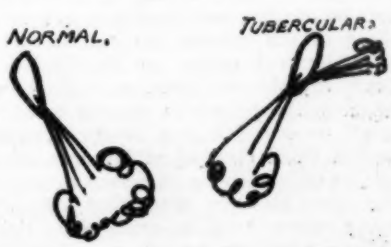
I am indebted to Dr. Statham and Dr. Herapath for permission to publish this case.

L. B. PHILLIPS, M.B., Ch.B.,
Resident Obstetric Officer, Bristol Royal Infirmary.

AN EARLY CYSTOSCOPIC SIGN OF RENAL TUBERCULOSIS.

THE following is a sign occasionally seen with a cystoscope before the bladder picture becomes typical.

The sign may be described as a rebound of the coloured urine on the pathological side (methylene blue or indigo-carmine being used). The accompanying diagram explains it. The rebound is caused by the stream impinging on the lower edge of the ureter opening, which is slightly raised, hardened, and thickened.



Liverpool. FRANK JEANS.

Reports of Societies.

RADIOLOGICAL PITFALLS.

AT the Royal Society of Medicine on November 17th a combined meeting took place of the Sections of Electrotherapeutics, Medicine, Surgery, and Orthopaedics for a discussion on radiological pitfalls.

Sir HENRY GAUVAIN, President of the first-named Section, who was in the chair, said that Murray's English Dictionary defined a pitfall as "a trap or crafty device to catch by surprise the unsuspecting or unwary." He was sure that all radiologists or those who had to do with *x*-ray results had at times fallen into pitfalls, and he hoped the discussion might show how these were to be avoided.

Dr. A. E. BARCLAY (Manchester), opening for the Section of Electrotherapeutics, insisted, in the first place, that the radiologist's function was, not to make a diagnosis, but to forge a link in a chain which resulted in a diagnosis. He regarded a pitfall as nothing more than an appearance which gave rise to a blunder, self-evident as soon as the interpretation was known. To make mistakes on the way to knowledge was more honourable than to escape them by shirking the quest. It was necessary to settle down quietly to study the radiogram. Routine might cause apparent delay, but the physician would be well advised to let routine be carried out; it would obviate many errors. If the radiologist knew the clinical diagnosis in a case beforehand his own conclusions must be prejudiced by that knowledge, but he should, Dr. Barclay contended, be given everything vital in the history of the case, as that would enable him to make his examination on the right lines. And the danger of prejudice was so great that it was of doubtful benefit to the patient for the physician to act as his own radiologist. The only practical plan was for the radiologist and the physician to arrive at their conclusions independently, and then consult together. At the present day there was a tendency to saddle the radiologist with an undue measure of responsibility; he should not guess beyond the limits of his knowledge of what he had seen. It was still necessary to say that, unless films were of good quality, this very inferiority constituted a real pitfall. Some faults were attributable to dark-room carelessness. To demonstrate by radiogram early changes in disease of bone, such as osteomyelitis, might be difficult, but it should always be remembered that such changes took time. Most pitfalls could be avoided if the radiologist kept his eyes open not only radiologically but medically, and avoided coming to hasty conclusions.

Dr. E. I. SPRIGGS said he considered that the first and greatest pitfall was that of allowing radiological or any other special examination to take the place of a study of the early history and clinical symptoms of a case. The radiologist, the surgeon, and the morbid anatomist could always find something; the important point was as to whether that "something" had anything to do with the illness of the patient. Generally, a "finding" was not a diagnosis; a dropped stomach or a dropped colon was not a diagnosis; the condition resulted from something lying outside the viscus, and an attempt to cure the viscus as such would not cure the patient. A second great cause of pitfalls was lack of co-operation between radiologist and physician. The radiologist should form an independent opinion on his own routine, but he should be told something of the general clinical character of the case. Also, in abdominal cases, he should be told about pains, as much valuable information could be obtained by observing whether the pain was present when a certain part of the bowel or stomach was filled, or when it was contracting. And a third class of pitfall was that arising from imperfect examination—a partial examination. A great difficulty was presented by interlobar effusions in the lung, and many errors could be avoided by the precaution of taking oblique pictures; having a patient in the lordotic posture revealed an unsuspected interlobar effusion, as demonstrated on the screen. A fixed technique meant an incomplete examination; no technique should be excluded which could yield information.

Mr. MAX PAGE (Section of Surgery) devoted his attention especially to mistakes in the diagnosis of fractures and of malignant disease of bones. He had some sympathy with clinicians who said that the radiologist was allowed to take too important a part in the diagnosis. That was especially true when it was a matter of teaching. Radiology having come to stay, however, one had to appreciate that it was a physical method which could be used as an addition to the employment of the senses, but by no means as a substitute for what the senses conveyed. Foolish mistakes had been seen by him because two views had not been taken; he strongly urged the value of stereoscopic pictures. He showed a number of slides of skiagrams of cases with odd ossicle formations, such as at the os trigonum and the sesamoid bones, and extra ossicles in the patella, leading to the diagnosis of loose cartilage in the joint. Usually, radiograms would not indicate whether a bone tumour was simple or malignant.

Mr. H. A. T. FAIRBANK said that what was a pitfall for the less experienced radiologist or surgeon might, in some cases, be regarded as a difficult diagnosis for the expert. Two not uncommon causes of error in diagnosis were ignorance of the normal anatomy as shown by *x* rays, and the arriving at a conclusion on an imperfect film. Sometimes error was due to a careful consideration of the pocket of the patient in respect of having several films taken. He thought no more difficult cases occurred than those of differentiating spinal caries cases from those of deformity due to developmental error, and it was very difficult to recognize the very early stage of coxa vara in the adolescent. The displacement was slight, and the lesion at the epiphyseal line was often overlooked, particularly if the film was not a clear one. Accurate diagnosis and early treatment would give a practically normal hip, but if allowed to become seriously displaced the patient had a damaged hip for life.

Dr. ARTHUR F. HURST referred to ten radiological pitfalls in connexion with gastro-intestinal disease. He said the earliest radiological sign of growth in the stomach was a fading away of peristalsis as the wave passed along the greater or lesser curvature, and this the radiogram did not show. One should be careful about diagnosing a gastric ulcer near the cardia; most lesions in that situation were not ulcers at all, but congenital gastric diverticula. One should never diagnose pyloric obstruction from the presence of stasis alone, even twelve-hour stasis, unless there was also exaggerated peristalsis; 95 per cent. of cases of pyloric obstruction not due to growth were due to duodenal—not gastric—ulcer. "Adhesions in the right iliac fossa" was a favourite diagnosis in the presence of pain after an appendix had been removed, but it should not be made, even when the appendix was present, without carrying out the most important test of inflating the rectum and pelvic colon with air; this enabled one to unravel the terminal ileum. Ileal stasis hardly ever existed. Gastroptosis should not be diagnosed simply because some viscus reached a long way down. There was no evidence in the type of case he showed on the screen that the stomach had dropped from anywhere; it was merely a congenitally long stomach. The same could be said about the transverse colon. He at one time associated a stomach in a patient having duodenal ulcer with hypertonia, but he was now convinced that the tone of such a stomach was no greater than the usual. When one detected a collection of gas under the right side of the diaphragm, above the liver, apparently by *x* rays, it was almost impossible to know what it was, because on giving a barium meal or an enema it disappeared and one saw the caecum. It could be concluded that it was really megalo-colon, which was not so uncommon as some supposed.

Dr. A. C. JORDAN showed a number of slides illustrative of pitfalls in the diagnosis of intestinal conditions.

Dr. H. WARREN CROWE (Harrogate) spoke on radiological pitfalls in reference to the teeth. He thought it would be generally admitted that no radiogram of the teeth would ever prove a negative; if no sign of disease appeared in the *x*-ray picture, the tooth, if taken out and cultured, might still prove to be infected. Some people held to the view that a tooth which was still vital could not

be infected; but that was a fallacy. Because a person's teeth were very bad it did not follow that his systemic disease was being produced by them.

Dr. F. HERNAMAN-JOHNSON spoke of cases in which, because a lump in the abdomen was not evident to the rays after an enema, it was concluded to be due to a collection of faeces, whereas it might be an early phase of carcinoma which was bringing about a functional paralysis leading to faecal accumulation. In a case of accident apparently involving a particular area, it was very important to radiograph the whole spine. He quoted a very instructive case in this connexion.

PYURIA IN CHILDREN.

A JOINT meeting of the Sections for the Study of Disease in Children, Therapeutics and Pharmacology, and Urology was held at the Royal Society of Medicine on November 24th. Mr. GEORGE E. WAUGH, President of the Children's Section, was in the chair. The subject under consideration was the treatment of pyuria in children.

Dr. E. A. COCKAYNE, in opening the discussion, said that his objects were twofold: first, to show the necessity for making certain that cases resistant to treatment were really cases of simple pyelitis, and not infections grafted on to some primary disease or malformation; and secondly, to point out the necessity for ascertaining what proportion of a long series of cases of pyelitis were incurable by hexamine or alkalis. Only in this way could some rough standard be found by means of which the newer remedies could be compared with the older ones and with each other. He emphasized the necessity for using all available means—radiography, cystoscopy, pyelography—in order to make a correct diagnosis. He dealt chiefly with pyelitis, as this was the most common cause of pyuria in children. A catheter specimen was necessary to verify the diagnosis, as pus in urine in quantities sufficient to simulate that seen in pyelitis might be derived from a vulva which was not the seat of any obvious purulent infection. A differential diagnosis had to be made between calculus, streptothrix infection, haemorrhagic nephritis, and lesions of the central nervous system—for example, spina bifida, juvenile tabes dorsalis, and general paralysis of the insane, or myelitis. Malformations of the urinary tract had to be considered as possible causes—for example, congenital phimosis, hypospadias, epispadias, ectopia vesicae, diverticula of the bladder, aberrant renal arteries, congenital stenosis, or dilatation of the ureter. Many of these conditions might cause a pyuria, usually due to *B. coli communis*, that could not be distinguished from simple chronic pyelitis without the exercise of great care. No case of chronic infection of the urinary tract should be regarded as a pyelitis unless the possibility of mistaken diagnosis had been eliminated by means of radiography, cystoscopy, and pyelography. In all cases of long continued pyuria an estimation of the urea and non-protein nitrogen in the blood was of value. Nitrogen retention indicated damage to the kidneys. In his experience a very small proportion of cases of pyelitis in which there was no underlying cause failed to recover. In regard to the etiology of pyelitis, whether of the newborn, of infants, or of older children, the great majority showed *B. coli communis* to be the infecting agent.

Passing to treatment Dr. Cockayne emphasized the primary necessity of flushing the urinary passages. This could be achieved in infants by giving plenty of plain or sweetened water between feeds. As much as one to two pints in the twenty-four hours could be given. If it was impossible to give fluid by the mouth because of vomiting, then it could be given by the rectum with glucose and sodium bicarbonate, or subcutaneously, or intraperitoneally. Sufficient potassium citrate and sodium bicarbonate should be given to keep the urine alkaline, specimens of which should be tested at frequent intervals. If such cases were secondary to a gastro-enteritis which was still active, purgation, colonic lavage, and other measures should be undertaken in addition. In older children the symptoms were very variable; some had frequency of micturition and enuresis or haematuria, others had constitutional symptoms such as remittent pyrexia, convulsions, or rigors. Sometimes the discovery of pyuria was only made in the course of a routine examination of the urine. The treatment of these cases consisted in rest in bed, milk diet, and a large fluid intake. For febrile cases either alkaline treatment or urinary antiseptics could be used. For afebrile cases hexamine, 5 grains three to four times a day, was found to give the best results. Treatment should be continued a week after sterile urine had been obtained, and a cure should not be pronounced until another sterile specimen had been obtained one week after the treatment ceased. For resistant cases alternate weekly courses of alkalis and hexamine seemed to give better results. The possibility of other infections, such as typhoid, paratyphoid, bacillary dysentery, *B. pyocyaneus*, *B. proteus*, streptococcus, and staphylococcus should be borne in mind. Dr. Cockayne added that his experience of the newer remedies—methanamine and hexyl-resorcinol—was too small to be of any value.

Dr. ELIZABETH H. LEPPER then read a paper on the reaction of the urine in relation to the treatment of coliform infections with alkalis and with hexamine. This paper was the result of joint investigations by Dr. Dorothy Hare, Dr. Marjorie Martland, and herself. Dr. Lepper stated that, although it was a matter of general observation that the administration of alkalis in coliform infections of the urinary tract relieved the symptoms and apparently cured the patient, the reason for this was not clear. They had found that alkalis had no lethal effect on bacteria. The urine showed a slight increase in the number of bacilli present. A disappearance of the infection as a result of alkaline medication had never been seen by them. A second possibility was that the symptoms were relieved by neutralization of an acidosis. The blood was therefore examined in six acute cases before alkaline treatment was started. The bicarbonate content of the plasma in every case fell within normal limits. Thus there was no evidence of acidosis, and yet all these cases responded quickly to alkalis and the symptoms disappeared. They then considered whether the reaction of the urine was the factor determining the alleviation of symptoms. The *p*H of morning and evening specimens was estimated, and it was found that as soon as the urine became really alkaline—that is, when the *p*H had reached 7.4 to 7.6—the symptoms were relieved. Early morning specimens were most acid unless alkalis were given at four-hourly intervals throughout the twenty-four hours. It was thought that possibly the benefit from alkalinizing the urine depended on the local effect of the reaction of the urine on the inflamed tissues of the urinary tract. There was some evidence that alkaline fluids were less irritating to inflamed surfaces than acid ones. The hydrogen-ion concentration might be of importance in determining the rate and force of the muscular contractions by which urine was propelled from the pelvis of the kidney to the bladder. The work done hitherto on this hypothesis had given contradictory results. The dose of an alkali could only be adequately controlled by testing the reaction of the urine with certain precautions. Misleading data were inevitable when the ordinary hospital routine of testing urine in an open jar with litmus was followed. Litmus was not a good indicator. Red litmus turned blue at *p*H 6.6—an acid reaction—a point at which symptoms were not relieved. A specimen in an open vessel quickly lost CO_2, and therefore urine, if neutral when passed, became alkaline after standing. The method proposed by Sir Charles Martin was to collect the urine in wide-necked stoppered bottles under toluene. The toluene prevented loss of CO_2 when the bottle was opened, and also inhibited bacterial growth, which would alter the hydrogen-ion concentration. In summing up Dr. Lepper said that the administration of alkalis in coliform infections of the urinary tract cured the symptoms. Alkalis had no lethal effect on the bacteria, nor did they act by neutralizing an acidosis. They altered the hydrogen-ion concentration of the urine, and two ways had been suggested in which this might be of importance as regards symptoms.

Dr. Lepper then passed to a consideration of the action of hexamine. If properly administered it was effective in combating coliform infections. Its action depended on its dissociation into formaldehyde and ammonia. In cases of coliform infection in adults gr. 15 of hexamine was given

three times a day. The more acid the urine the greater was the amount of formaldehyde liberated. There was no formation of formaldehyde until the *p*H of the urine was less than 6.0. Results of adding acid phosphate in cases in which the *p*H was not so low as 6.0 were irregular. The greatest concentration of formaldehyde in the urines was 1 in 20,000. Experiments with various cultures of *B. coli* showed that a dilution of 1 in 20,000 allowed only a few bacilli to grow, whereas 1 in 10,000 was lethal. Some strains were more susceptible than others. Experiments were tried adding varying amounts of N/10 HCl to 1 per cent. hexamine solutions. Hexamine and HCl made an excellent buffer mixture between *p*H 6.0 and 4.0. Hexamine therefore behaved like a weak base, probably forming salts with the hydrochloric acid. There was no considerable liberation of formaldehyde until *p*H had fallen to 4.0. The liberation of formaldehyde was increased at body temperature. The conclusions reached, therefore, were that there were two factors of importance in the action of hexamine as a urinary antiseptic: first, the capacity of the patient to secrete an acid urine; and second, the susceptibility of the infecting organism to the action of formaldehyde.

Mr. JOHN EVERIDGE next briefly discussed cases of pyuria which had not cleared up with alkalis or hexamine. He had concluded that in these cases there was an underlying organic cause, either in the gastro-intestinal or urinary tracts. He dealt with the surgical treatment of such conditions, and showed some interesting slides. Those who took part in the general discussion seemed to be in agreement that, except for Dr. Lepper's recent research work, all the remarks could have been endorsed twenty years ago, and that very little real progress had occurred in the knowledge of this particular subject. Dr. H. C. CAMERON emphasized the fact that cases of pyuria were often found in the course of a routine examination of the urine, and another speaker stated that he had proved in his own experience that 60 per cent. of cases in children cured themselves.

The CHAIRMAN summed up by stating that what was needed was team work. A team of four—physician, biochemist, pathologist, and surgeon—should co-ordinate their findings on every case. Until this was done the study of pyuria in children could not greatly advance.

THE SCIENTIFIC BASIS OF MEDICAL HYDROLOGY.

THE President of the Section of Balneology of the Royal Society of Medicine, Dr. L. C. E. CALTHROP of Harrogate, gave his presidential address on November 23rd, and made it a plea for further investigation with regard to the scientific basis of medical hydrology. Notwithstanding the recognition of balneology twenty years ago as one of the subjects which might fittingly be made the province of a special section in the newly formed Royal Society of Medicine, there were still many members of the medical profession who were quite ignorant of the science of medical hydrology or were frankly sceptical as to its results. The root causes of such scepticism, said Dr. Calthrop, were both immediate and remote. Until quite recently there was practically no teaching or demonstration of the subject in any British school, and even now this country was far behind France, Germany, Italy, and the United States in this respect. Again, with all due acknowledgements to previous writers, there was still great need for a first-class British textbook of medical hydrology, one which would give not only the theoretical and scientific aspects of the subject, but also a clear account of how to administer the various treatments. A further cause of scepticism arose out of the fact that, although baths had been employed ever since Hippocrates, the practice had been purely empirical, and still remained so to a very large extent. The actual means and methods of applying water treatment which were available to the old practitioners were very simple: immersion baths, shower baths, steam vapour and hot air, mud baths, shampooing and massage, and water-drinking. Whatever observations were made by the old physicians were based on these simple means of hydrological treatment. It was not until the middle of the seventeenth century that any attempt was made at a scientific observation of the physiological facts. He cited the work of Sir John Floyer of Lichfield (1649-1734), who was a pioneer of water therapy; in his experiments were to be seen the beginnings of research into the action of cold water in the treatment of disease. The earliest account of any attempt to make accurate analyses of English waters was by Dr. Thomas Garnett (1766-1802), who published an analysis of the Harrogate waters. Among foreign workers he instanced Winternitz, who, at the university clinic at Vienna, made memorable experiments into the physiological and therapeutic action of waters. Coming to quite recent times, Dr. Calthrop cited some of the outstanding investigations in balneology during the last few years, such as the effect of various forms of baths upon blood pressure, and the influence of intestinal lavage upon toxic conditions of the bowel. In many such investigations the members of the Section whom he was addressing had taken a prominent share. Many questions yet awaited an answer, especially as to the limitations of thermal and mineral waters.

TREATMENT OF SKIN DISEASES.

AT a meeting of the Aberdeen Medico-Chirurgical Society, on October 26th, Dr. J. F. CHRISTIE delivered his presidential address on skin diseases, with special reference to treatment.

Dr. Christie first emphasized the importance of accurate diagnosis, which in dermatology could only be taught clinically. He attributed the general lack of interest taken by the medical profession in skin diseases partly to the nomenclature, and to the facts that affections of the skin were considered trifling or something to be ashamed of, and that proficiency in their treatment necessitated many years of study of large numbers of cases. Rest was as important therapeutically in skin diseases as in other affections of the body. Other primary considerations were the dressing of the case, the proper application of ointments, and the careful removal of adherent dressings. Soap and water should usually be avoided. Diet required careful regulation, including the cutting out of all spiced and highly seasoned foods in the acute stages of skin affections. In acne vulgaris general tonic medication must be supplemented by very thorough local treatment; sulphur in one form or other had been found to be the best, and Dr. Christie recommended the treatment described by McKenna with "lotio alba," which was applied by dabbing on to the face with a pledget of lint, three or four times a day, until the skin began to crack and peel. After ten days equal parts of glycerin amyli and salicylic acid ointment were applied at night, and immediately gave relief to the drawn skin. The lotion was still applied twice during the day and the mitigating ointment used nightly. In Dr. Christie's opinion the best time for beginning the mitigating ointment was ten days after the commencement of the lotion treatment, and he added that it was remarkable how a coarse, greasy skin, studded with blackheads, cleared up. *X* rays were mentioned as giving perhaps the best results, but accurate electrical measurement and fractional dosage were considered essential. Dealing with ultra-violet light, the speaker was of opinion that most benefit was derived from this form of treatment in the relic lesions of acne. Collosol manganese was not recommended, apart from its great value in cases of true boils. For scabies nothing had yet, in the speaker's experience, superseded the employment of sulphur ointment. In alopecia areata ultra-violet rays had given excellent results. Patients suffering from chilblains were divided into two types: the fat type, preferably treated with thyroid extract and Lugol's solution, and the thin type, where the best results were obtained by giving calcium in some form; mention was also made of Cranston Low's modified Bier's congestion method. Good results had been obtained in cases of naevus by using radium "slowly," and Dr. Christie thought that a cure might be effected in cases of naevus flammeus. In the treatment of eczema he strongly recommended pasta zinci co. with 3 per cent. of crude coal tar; with this he has had under 1 per cent. of failures. The interesting dermatitis artefacta was next dealt with, and many of the numerous pitfalls explained. For the treatment of impetigo contagiosa, although the speaker

still favoured the boric starch and dilute mercurial method, he admitted that the best results had followed the application of 1 in 1,000 acriflavine emulsion. The x-ray treatment of ringworm was next mentioned and the risks explained. Thallium acetate had been tried in six cases; two showed good results, the others were still under treatment. The use of Wood's glass for detecting infected hairs with the aid of ultra-violet light was demonstrated. Verruca vulgaris occasionally cleared up, even in obstinate cases, after 10 to 15 grain doses of calcium lactate for two to three weeks. Dr. Christie, speaking of the treatment of syphilitic lesions of the skin, pleaded for the standardization of the blood tests, and said that too much value should not be attached to a single positive Wassermann reaction in a patient without any clinical signs or symptoms.

Reviews.

MUSCULAR MOVEMENT.

Muscular Movement in Man[1] is based on a series of lectures, delivered at Cornell University by Professor A. V. HILL during 1926 and 1927. Authors of scientific books, who are themselves continuously engaged in research, often receive, and perhaps merit, the criticism that they "cannot see the wood for the trees." It is an especial gift of Professor Hill's that, having passed unscathed through the thorniest thickets of technique, he can turn round and survey, not only the wood, but a good slice of the surrounding countryside as well, for the benefit of his friends and readers. And his reason for doing so could not be bettered: "To tell the truth, we don't do it because it's useful, but because it's amusing." In a period of rather feverish effort to gain scientific knowledge applicable to this or to that practical end, the sentiment is thoroughly refreshing. Whatever the motive, however, the book is largely devoted to a discussion of results obtained by applying principles, developed in the laboratory, to everyday life. Chemical, mechanical, and thermal considerations have led Professor Hill and some others to certain conclusions about muscular activity, its possibilities, and its limitations: how does the human body daily conform to these limitations and exploit these possibilities?

In another place the author has urged the perusal of a table of physical constants as a useful exercise for the scanty leisure of the biologist. From such a perusal he deduces, among other things, that, were nervous conduction dependent only on physical diffusion of ions, it would take "geological time" for an impulse to travel from a whale's head to its tail. In the present volume he deduces, by the aid of some simple mathematics, that the maximum speed with which an animal can move its limbs is, for animals of approximately similar form, independent of its linear dimensions; in illustration: "even the grasshopper and kangaroo do not differ in order of their long jumping capacities."

Professor Hill does not confine himself to general considerations, however entertaining they may be. He discusses, in some detail, and with very great lucidity, such questions as oxygen debt, and the mechanical efficiency of muscle, and their application to the problems of athletics. The question of theoretical maximum work and the problems of viscosity of muscle are treated briefly, but in such a way that anyone interested in physiology in general but without special mathematical equipment can read them with pleasure and profit. There is little doubt that great advances towards a real understanding of the problems of muscular contraction will follow further elucidation of the viscosity changes which occur within the cell.

It will be obvious from what has been said that the reader is conducted over a wide range of territory, and introduced, if introduction be needed, to some very beautiful experimenting and very clear reasoning. Had it been possible we could wish that the author had discussed the question of the relationship of the life phenomena of the muscle cell to the happenings in the cells of other tissues: how far are the former typical of biological processes in general—how far are they merely a specialized machinery, proper to muscle, and to muscle alone?

The book is marred only by one or two misprints: in particular, the obvious error in the scale of the curve on page 43.

[1] *Muscular Movement in Man.* By A. V. Hill. London: McGraw-Hill Book Co., Inc. 1927. (Med. 8vo, pp. 104; 32 figures, 1 plate. 12s. 6d. net.)

DIAGNOSIS AND TREATMENT OF RENAL DISEASE.

THE popularity of Professor HUGH MACLEAN'S *Modern Methods in the Diagnosis and Treatment of Renal Disease*[2] is shown by the calls for fresh impressions of the first and second editions and for this, the third edition, since it was originally published in 1921. The value of the functional renal tests, which he then so clearly described, has now been generally recognized, and their application has not only been of the greatest use in diagnosis and prognosis, but in coming to a decision whether or not, and, if so, when to operate, especially in regard to prostatectomy; thus have many lives been saved. Probably many obscure deaths after general surgical operations are due to unsuspected renal insufficiency.

The simple division of nephritis into hydraemic (parenchymatous) and azotaemic (interstitial) is retained, and the description of the functional tests remains as before, but the chapter on treatment has been entirely rewritten, and deals with acute nephritis and the two forms of chronic nephritis on sound common-sense principles and also in detail; suggestions, though not intended to be too rigidly dogmatic, are given for each day of the first week and for successive weeks in acute nephritis. A warning is thrown out against too much fluid intake and any attempt to "wash out the toxins." For uraemia, both in acute and chronic nephritis, venesection and morphine are preferred to lumbar puncture. In hydraemic nephritis protein restriction is shown to be harmful, and a high protein diet to be often followed by disappearance of dropsy. In the azotaemic form the common mistake is to give an unnecessarily low protein diet. In the course of some general considerations on treatment the experimental production of renal lesions by high protein feeding is discussed, and reference is made to his observations with Smith and Urquhart, published last year, which showed that the abstinence from fresh vegetables and not a high protein diet is responsible for nephritis in rabbits; this seems to make it probable that the use of fresh vegetables is more important than abstinence from protein in nephritis.

This extremely useful handbook is both scientific and thoroughly practical, and thus has rightly been recognized as a book to buy and keep at hand for reference and advice in emergencies.

CEREBRAL LOCALIZATION BY CLINICAL MEANS.

DR. GIOVANNI PICCOLI, in his work on nervous syndromes consecutive to gunshot injuries of the brain,[3] has brought together a number of cases under his own observation which throw light on the localization of cerebral function. In many instances such injuries, after healing has taken place, leave residual lesions of so well defined a character as to possess a value almost equivalent to that of physiological experiments. The delimitation of the lesion in the living patient is not, according to the author, as difficult a matter as might be supposed; in addition to the ordinary means of localization, that of Pierre Marie is said to give very accurate results. In this method a standard radiogram is taken of the normal skull of a cadaver, in which the relation of the convolutions to the skull is indicated by the shadows of wires passed through the skull in various directions; by comparing this with a radiogram of the patient's head accurate determinations of the seat of the lesion can be obtained.

In the light of the cases cited the author discusses the characteristics of the motor palsies and sensory disturbances following strictly cortical lesions of the Rolandic

[2] *Modern Methods in the Diagnosis and Treatment of Renal Disease.* By Hugh Maclean, M.D., D.Sc., F.R.C.P. Modern Medical Monographs. Third edition, revised and enlarged. London: Constable and Co., Ltd. 1927. (Demy 8vo, pp. viii + 135; 4 coloured plates, 4 figures. 12s. net.)

[3] *Sindromi Nervose Organiche Consecutive a Lesioni del Cervello per Ferite di Guerra.* By Dr. Giovanni Piccoli. Bologna: L. Cappelli. 1927. (Cr. 4to, pp. 157. L.25.)

area, the causes of muscular atrophy in cortical affections, the causes of spasmodic contraction in paralysis, the localization of the motor centres and of the several species of sensibility. Other chapters are devoted to apraxia, disturbances of speech, frontal, occipital, and cerebellar lesions, and epileptic and subjective disturbances. Thirty-two cases of head injury and their symptoms are described, and the discussions of which they form the basis give a valuable summary of present views on the problems involved.

COURT ETIQUETTE AS A CAUSE OF MADNESS.

IN *Le Mal Héréditaire*[1] (second series) the indefatigable Dr. CABANÈS continues his pathological history of the kings of Spain. In the first chapter he describes the last years of Charles II, the miserable sufferer from scrofula and fever with whom the line of the Emperor Charles V ended in 1700. The crown then passed to the grandson of Louis XIV of France, the Duc d'Anjou, who ascended the throne of Spain as Philip V. In his former volume Dr. Cabanès described the eccentricities of Charles V's descendants: Philip II, who used to put himself into a coffin which formed part of the furniture of his room, and who within a few hours of death placed his crown upon a skull; Philip III, who was asphyxiated by the fumes from his brazier because the only official entitled by etiquette to open the door of the king's chamber happened to be absent; Philip IV, whose life was carried on with clock-like regularity, with daily occupations that never varied throughout the year, and with a face, so it is alleged, that never changed its expression. It might have been thought, says Dr. Cabanès, that the change of dynasty on the death of Charles II would have changed the conditions from which the kings of Spain suffered. But it was not so, and the Bourbons, like their predecessors, became the victims of their surroundings. Dr. Cabanès contends that these surroundings were so sombre and sinister as to affect with the same neuropathic condition even the imported line of monarchs. Overshadowed by all-powerful first ministers, surrounded by spies, constantly controlled by their confessors or almoners royal, with no distractions except bull fights, autos-da-fé, and occasional hunting, it was not surprising that the sovereigns of Spain became first neuropaths, then psychopaths, and finally lunatics. Thus it was that Philip V became, after a time, as mad as Charles II; that Louis I was a morose and narrow devotee; that Ferdinand VI inherited the malady of his father; and that Charles IV, who devoted loving care to a vast collection of watches and clocks, was a ludicrous monarch, completely under the thumb of his minister Godoy, and married to a queen who was another Messalina. Charles III alone gave any sign of being a normal individual. Dr. Cabanès attributes this disastrous history, of more than two centuries' duration, to the etiquette which crushed all freedom and life out of its royal victims, and made the court for them a living tomb.

NOTES ON BOOKS.

SIR SAMUEL HOARE, Secretary of State for Air, has written a vivid account of his flight in the Imperial Airways passenger aeroplane from England to India. His book, *India by Air*,[3] is full of excellent photographs and interesting stories of his experiences, and Lady Maud Hoare, in a short and racy introduction, tells us her sensations in rough weather. She was, she says, too interested to be frightened, was more comfortable than in a first-class railway carriage, and spent much of her time in the air in writing. There is a thrilling account of an attempt to fly through a terrific sandstorm near Karachi. "In a few minutes the sand blotted out from view the land below us and scorched the faces of the pilot and the navigator. By sudden jumps the altimeter began to fall from the 2,000 feet mark to the 200 feet mark, and from the 200 to the 20. We could now see the sea, that at one time was not more than 12 feet below us—a nasty grey sea with ugly white horses—on each side was an impenetrable wall of fog." The successful termination of a flight such as this shows the great progress made in the safety of travel in the air, and suggests that convalescent patients could be comfortably and quickly transported to Egypt, and urgent cases requiring treatment could be brought to a suitable centre, as regular passenger services are now running.

The Elements of Pharmacology,[4] by Professor W. A. OSBORNE, is a little textbook written for the use of the medical students of the University of Melbourne. The author has aimed at setting forth the main facts of pharmacology in a concise form, and in this aim he has certainly succeeded, for the subject has been compressed into sixty-five pages. Such drastic compression of pharmacology at the hands of a physiologist will naturally raise mixed feelings in the breasts of the teachers of the former subject. Professor Osborne has, however, made a very good summary of the salient facts, and has also managed to produce a readable account of the subject. By discussing only a limited number of drugs, and by omitting such subjects as materia medica, dosage, and pharmaceutical chemistry he has avoided condensing the material into a mere catalogue. The book is evidently intended as an introduction to pharmacology for students who have not commenced clinical work, and should answer this purpose very satisfactorily provided that the condensed information it supplies is supplemented by lectures and demonstrations.

Last year (December 4th, p. 1072) we published a rather elaborate review of the *Medical Art Calendar* issued by Mr. J. Philip Kruseman of the Hague. He has now produced a calendar for 1928; it contains a series of illustrations, some taken from pictures and some from books, all very well reproduced. This number has a good many illustrations of dentists and of surgeons at work, but there is one of an apothecary sitting in an armchair teaching his apprentice how to pound drugs, and another, of a female water doctor; pictures of female quacks are said to be uncommon. The *Calendar*, which is meant to be hung upon a wall, can be obtained from Mr. Kruseman, 'S-Gravenhage, Noordeinde 91, Holland, price 6s. post free.

[1] *Le Mal Héréditaire.* Par Dr. Cabanès. Deuxième série. Paris: Albin Michel. 1927. (5¼ × 7¼, pp. 340; illustrated. 15 fr.)

[3] *India by Air.* By the Right Hon. Sir Samuel Hoare, Bt., G.B.E., C.M.G. London and New York: Longmans, Green and Co., Ltd. 1927. (5½ × 8¼, pp. xix + 156; 35 illustrations and maps. 6s. 6d. net.)

[4] *The Elements of Pharmacology.* By W. A. Osborne, M.B., D.Sc. Melbourne: W. Ramsay. 1927. (6 × 8¾, pp. 137. 10s. 6d.)

PREPARATIONS AND APPLIANCES.

SYNTHALIN.

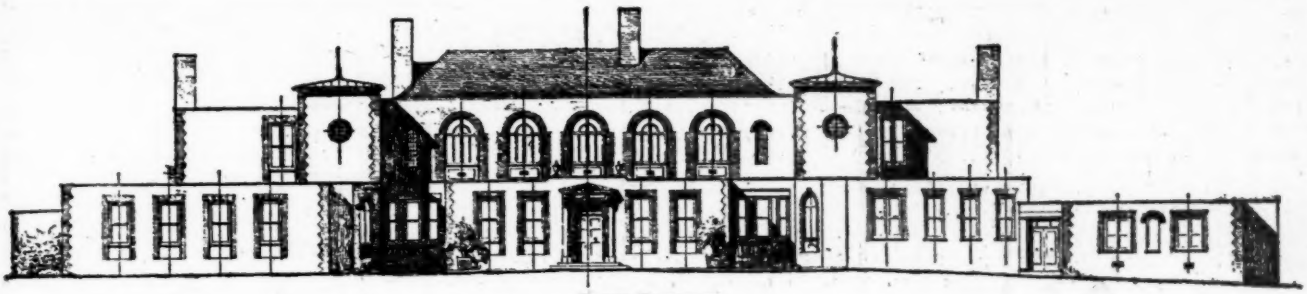
"SYNTHALIN" (Kahlbaum) is a synthetic preparation recommended for use in the treatment of diabetes. It is given by the mouth. As many of our readers will be aware, this substance was produced by Frank more than a year ago, but has only just been released for general sale to the medical profession. Its constitution is given by Drs. H. H. Dale and H. W. Dudley in a footnote to their paper, published at page 1027.

The vendors of the drug recommend it for "cases of diabetes of slight and medium severity." As a partial, or even complete, substitute for insulin in severe cases it seems generally agreed that its value is very doubtful.

The introduction of a substance which claims to be even a partial substitute for insulin, and to possess the two very important advantages that it is cheap, and can be administered by the mouth, is naturally a matter of considerable interest. Fortunately the Medical Research Council has been able to organize an investigation of the action of synthalin in several medical schools, and a preliminary report has been published (*Lancet*, 1927, ii, 517); this should be consulted by anyone intending to use the drug. The contributors to this preliminary report emphasize the fact that their experience is insufficient to permit of any final conclusion, but on the whole their reports are discouraging. Several investigators mention a disquieting number of toxic symptoms, and, in particular, the drug is suspected of a direct toxic action on the liver.

Professor Maclean, in the paper with which he opened the discussion in the Section of Medicine at Edinburgh, on the results of insulin therapy in diabetes mellitus, made a brief reference to the drug. As will be seen (p. 1019), he said that when given by the mouth it produced a definite effect in certain cases of diabetes, but added: "The product, however, has marked toxic properties, and tends to produce gastro-intestinal and other disturbances, so that its use in the treatment of diabetes is at present not practical."

Clinicians in this country admittedly have not yet had sufficient experience of the drug to permit of final judgement, but the evidence available suggests that it is one that must be used with great caution, and that, until our knowledge is more complete, it will be safest in the hands of those who have special experience of diabetes, and who have special facilities for following the action of the drug.



FRONT ELEVATION.

EPSOM COLLEGE SANATORIUM.

PLANS have now been prepared by Messrs. W. A. Pite, Son and Fairweather, architects, for a new sanatorium at Epsom College. It is proposed to erect a two-storied building of red brick, with quoins and window dressings of red brick of a richer colour. Over the central portion there will be a sloping roof, but the remainder of the building will have flat roofs covered with asphalt. All the wards will face south, and ample provision is made for wheeling beds into the open air. Low-pressure central heating by radiators will be used throughout the building, but the wards will have open fireplaces in addition. The boilers for the central heating and domestic hot-water supply will be placed in the basement below the kitchen wing, where also there will be a disinfector for clothing and bedding. Food for the patients in the isolation and the non-infectious wards will be supplied from the main kitchen, a lift being installed to the first floor wards; cooking will be by gas. The building will be lit throughout by electric light. The floors of the wards will be covered with battleship linoleum on a cement screed, flush with a coved border and skirting in cement; the corridor floors will be of asphalt laid in a similar manner. Gauged plaster, with a final coat of "sirapite," or similar preparation, will be used throughout.

The building has its long axis running east and west, with a centrally placed main entrance on the north side opening into a hall, to the right of which is the nurses' dining room, and beyond, the kitchen wing, with servants' hall and quarters for a married couple, who will act as cook and porter. To the left of the entrance hall will be a simply equipped operation room, and beyond this the out-patient wing, approached either from the corridor or by a separate outside entrance, through which stretcher cases can be wheeled direct to the wards. Rooms for the medical officer and matron, waiting, casualty, *x*-ray, and massage rooms will be provided. At each end of the main corridor a sixteen-bed ward projects south, forming, with a duty room, bathroom, sanitary annexe, and nurses' bedroom, a complete unit. Separating these ward units and opening direct into the main corridor will be four single-bed wards, and a dining and a recreation room, thus forming three sides of a square, the fourth, or south side, being open. The large sixteen-bed ward at the east end of the corridor will be an isolation ward. It will be shut off from the rest of the sanatorium by double doors, and the only access to it by patients will be by means of a separate external door. All the other wards on the ground floor, with a total of twenty beds, are reserved for non-infectious cases.

The first floor is approached by two staircases; one of these opens out of the ground floor corridor at the west end, and gives access to the staff bedrooms; the other leads from the lobby of the isolation ward to the first floor wards. It will consist of one eight-bed ward, one four-bed ward, two single-bed wards, and a small dining room, making, with the sixteen beds on the ground floor, a total of thirty beds for infectious cases.

We have received the following appeal for financial assistance for this undertaking, the cost of which is estimated at £26,600. The appeal is followed by the first subscription list.

APPEAL FOR SUPPORT.

SIR,—In your issue of December 18th, 1926, you published a letter from the chairman of council of Epsom College appealing for financial help from the medical profession to enable the council to build a new sanatorium and isolation block which, while providing adequate accommodation for the needs of the college, would at the same time be a model for all other schools to copy. It was also pointed out that the present sanatorium, built many years ago, is uneconomical in working, and its arrangements and accommodation in many ways do not conform to modern hospital requirements, but could, by a very moderate outlay, be adapted as a school house for from forty to forty-five boys. The existing isolation block is a temporary wooden building, the licence for the use of which expires shortly, making imperative the erection of a permanent building in the near future. Cases of scarlet fever and diphtheria are not dealt with in the isolation block, but are sent direct to the isolation hospital of the local authority.

At Epsom, following the practice of some other public schools, no provision is made in the school houses for the treatment of cases of trivial illness, but all cases, however slight, are treated in the sanatorium. This plan ensures every case being seen by a trained nurse at an early stage and by the medical officer, who is promptly summoned when necessary; but at the same time it also involves the provision of a larger number of beds than is necessary in those schools which have sick rooms in the school houses.

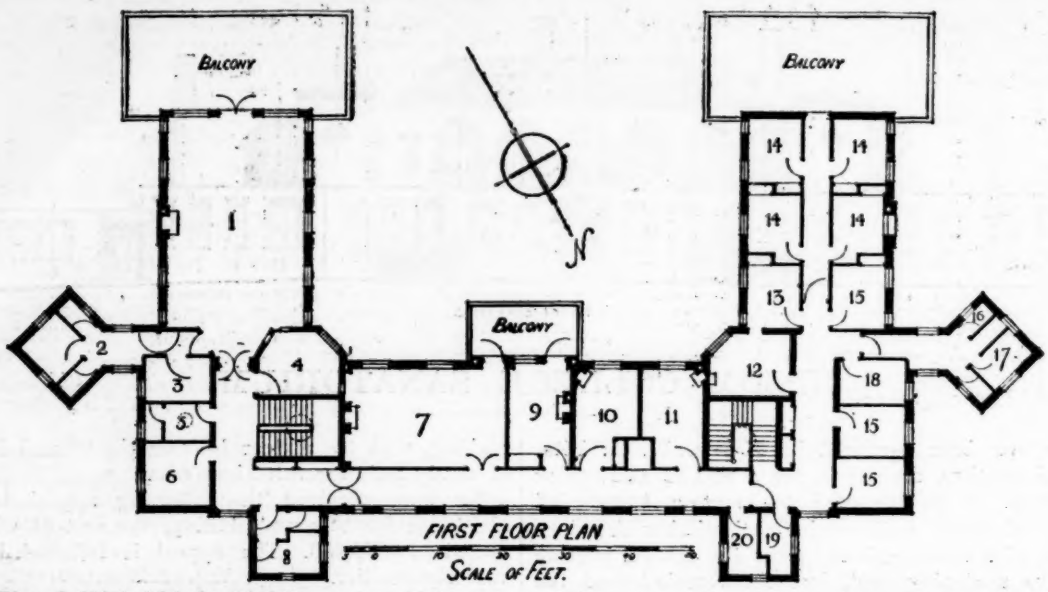
Experience shows that a well planned sanatorium, with a properly apportioned number of large and small wards to accommodate 12 per cent. of the boys in the school, meets all reasonable requirements for both infectious and non-infectious cases, provided that if a widespread epidemic of any particular disease occurs one of the school houses is temporarily converted to hospital purposes.

By adopting the plan, which has proved so successful and free from risk in the hands of Dr. Friend at Christ's Hospital, of housing infectious and non-infectious cases under one roof, but with separate means of access to each class of cases, the architects, Messrs. William A. Pite, Son and Fairweather, have, at the request of the council, designed a building which will be in every way a thoroughly up-to-date sanatorium, convenient and economical to work, and which, it is estimated, can be built for the moderate sum of £26,600.

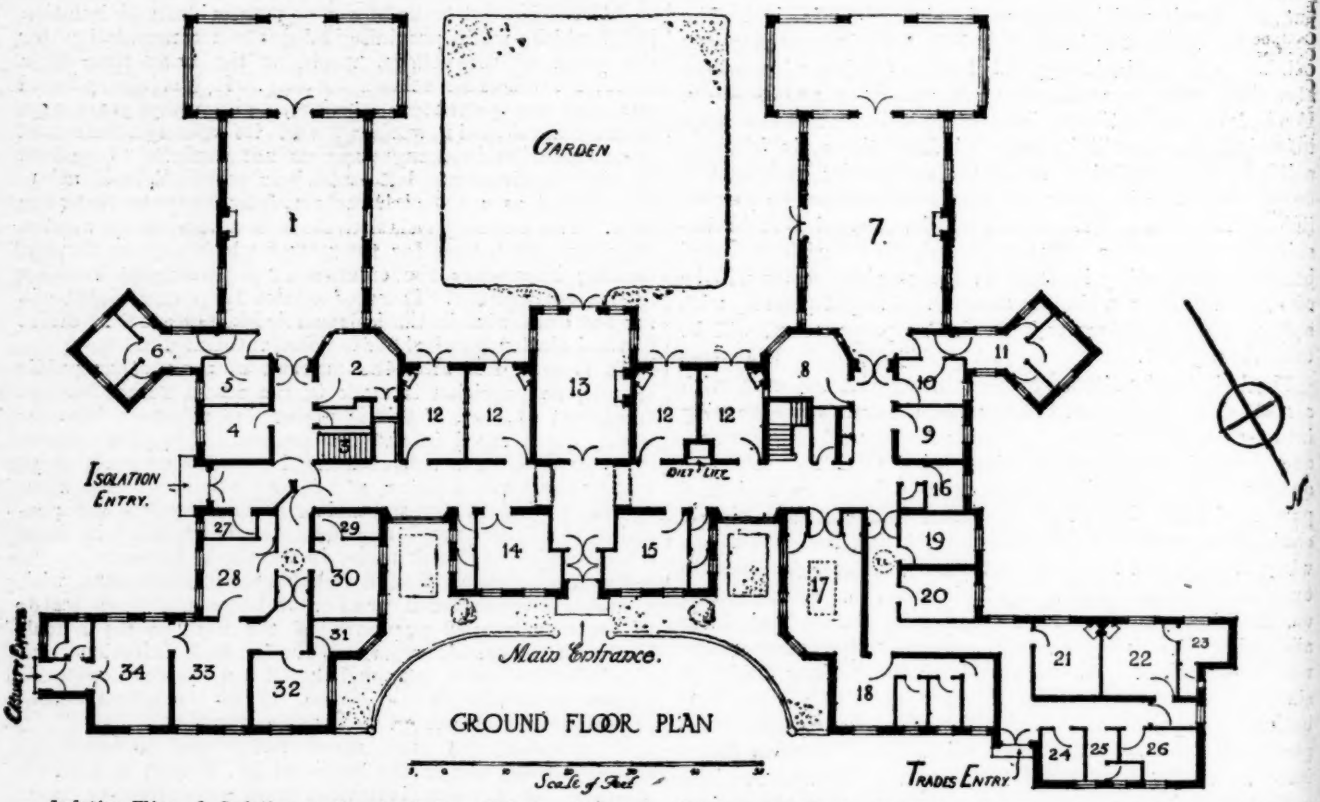
Taking 400 as the maximum number of boys in the school, provision has been made for 20 beds for the non-infectious cases and 30 beds for infectious cases, or 50 beds in all, with ample accommodation for the nursing and domestic staff. The details of construction are shown on the plans and dealt with fully in the memorandum accompanying this letter, so need not be further referred to here.

While the school fees paid cover the cost of the ordinary

[*Continued on page 1038.*



Isolation Wing.—1, Ward of 8 beds. 2, Sanitary annexe (sink room, w.c., cleaner, lavatory, and soiled linen). 3, Bathroom. 4, Duty room. 5, Nurses' bathroom and w.c. 6, Nurses' room. 7, Ward of 4 beds. 8, Sink room (patients' w.c. adjoining). 9, Single bed ward. 10, Single bed ward. 11, Dining room, with diet lift adjoining. 12, Matron's sitting room. 13, Matron's bedroom. 14, Nurses' bedrooms. 15, Domestics' bedrooms. 16, Domestics' w.c. and cleaner adjoining. 17, Nurses' bathroom and w.c. adjoining. 18, Domestics' bathroom and lavatory. 19, Box room. 20, Bathroom for small wards.



Isolation Wing.—1, Isolation ward and solarium, 16 beds. 2, Duty room. 3, Staircase to first floor, isolation wing. 4, Nurse. 5, Bathroom. 6, Sanitary annexe (lavatory, sink room, w.c.s, and soiled linen).
Sanatorium.—7, Ward and solarium, 16 beds. 8, Duty room. 9, Nurse. 10, Bath. 11, Sanitary annexe (lavatory, sink room, w.c.s, and soiled linen). 12, Single bed wards. 13, Dining and recreation room. 14, Operation room, staff lavatory adjoining. 15, Nurses' dining room, patients' lavatory adjoining. 16, Bath for patients in single bed wards (cleaner adjoining). 17, Kitchen. 18, Scullery with larders and store adjoining. 19, Linen and mending room. 20, Mattress store. 21, Staff dining room. 22, Married couple's room. 23, Bathroom and w.c. adjoining. 24, Soiled linen. 25, Boots (w.c. adjoining). 26, Wood and coal store. 27, Cleaner for isolation section. 28, Medical officer. 29, *X*-ray dark room. 30, *X*-ray room. 31, Dispensary. 32, Matron's office. 33, Casualty and dressing room. 34, Waiting room with lavatory adjoining.

Schedule of Staff Accommodation.

First Floor:	
Matron	1
West wing nurses	4
East wing nurses	1
West wing (domestics)	3
Ground Floor:	
Nurses	2
Married couple	2
Total beds	13

Schedule of Bed Accommodation.

Isolation:	
Ground floor, east wing	16
First floor	14
Total	30
Sanatorium:	
Ground floor, west wing	16
" " south wing	4
Total	20
Total number of beds	50

SUBSCRIPTIONS TO NEW SANATORIUM FUND.

	£	s.	d.
Ackroyd, Dr. C. H.	1	1	0
Adams, Dr. Fred	1	1	0
Aitken, Dr. Janet	2	2	0
Aldridge, Dr. A. W.	1	1	0
Andrewes, Sir F. W.	1	1	0
Anning, Dr. J. J.	1	1	0
Apothecaries' Society	105	0	0
Armstrong, Dr. E.	1	1	0
Ashmore, Dr. P. W.	2	2	0
Back, Ivor, Esq.	1	1	0
Bailey, Dr. B. E. G.	1	1	0
Balmer, Dr. Ruth, O.B.E.	1	1	0
Baron, Bernhard, Esq.	100	0	0
Barrett, Lady, O.B.E.	5	0	0
Barwell, Harold S., Esq.	2	0	0
Bathurst, Dr. Lacey	1	1	0
Beattie, Dr. J. M.	2	2	0
Bedale, Dr. F. S., *M.C.*	1	1	0
Bedingfield, Mrs.	1	1	0
Bedson, Dr. S. P.	1	1	0
Bennett, Dr. W. E.	1	1	0
Berry, Sir James	3	3	0
Blackburn, Dr. J. T.	1	1	0
Blandy, Dr. Marjorie	1	0	0
Bleaden, Wilfred H., Esq.	1	1	0
Bolton, Dr. Elizabeth	2	2	0
Bolton, Dr. J. Shaw	1	1	0
Bonser, Dr. Georgiana M.	1	1	0
Boycott, Professor A. E.	10	10	0
Braithwaite, L. R., Esq.	5	5	0
Brander, Dr. H. S.	2	2	0
Brander, Dr. W.	1	1	0
Brash, Professor J. C., *M.C.*	2	2	0
Briscoe, Sir Charlton, Bt.	10	0	0
B.M.A. Charities Committee	100	0	0
Broadbent, Sir John F. H., Bt.	10	10	0
Brough, Dr. D. S., *M.C.*	2	2	0
Brown, Dr. Alexander		10	6
Browne, Dr. Ada M.	1	1	0
Browne, Dr. W. A.		10	6
Browning, Dr. C. H.	2	2	0
Buchanan, Dr. R. M.	1	1	0
Bulloch, Dr. W.	1	1	0
Burton, J. A. G., Esq., *M.C.*	2	2	0
Buttar, Dr. Charles	2	2	0
Campbell, Dr. W.	1	1	0
Cardew, Dr. Henry J.	1	1	0
Cargill, L. Vernon, Esq.	5	0	0
Carr, Dr. Walter, C.B.E.	10	10	0
Carruthers, Dr. W. D.	2	2	0
Chang, Dr. V. E.	1	1	0
Cheatle, Arthur H., Esq., C.B.E.	10	0	0
Chick, Miss H.	10	10	0
Clark, Dr. A. H.	2	2	0
Cleminson, F. J., Esq.	26	5	0
Clothworkers' Company	100	0	0
Colebrook, Dr. Dora C.	1	1	0
Colledge, Lionel, Esq.	5	0	0
Colquhoun, G. R. E., Esq.	1	1	0
Cox, Dr. Alfred, O.B.E.	1	0	0
Crawford, Dr. J. J.	1	1	0
Crawfurd, Dr. Raymond	20	10	0
Crofton, Dr. W. M.	3	3	0
Cruickshank, Dr. J. N., *M.C.*	1	1	0
Cumming, Dr. W. M.	1	1	0
Cunning, J., Esq.	10	10	0
Cyriax, Dr. Kellgren	1	10	0
Davies-Colley, Miss Eleanor	2	2	0
Dawson, Dr. D. G.	2	2	0
Dean, Professor H. R.	25	4	0
Dearnley, Dr. Gertrude	3	3	0
DesVoeux, Dr. H. A.	2	2	0
Devitt, Dr. H. P. S.	5	5	0
Dible, Professor J. H.	4	4	0
Dixon, Dr. W. E.	3	3	0
Dobson, Dr. J. F.	5	5	0
Douglas, Dr. J. S. C.	1	1	0
Drake, Dr. J. E.	1	1	0
Druitt, Dr. D. C.		10	6
Dukes, Dr. C. E., O.B.E.	1	1	0
Dunbar, Dr. J. J. M.	1	1	0
Duncan, Dr. G. M.	1	1	0
Dunlop, Dr. A. J., *M.C.*	1	1	0
Dunn, Dr. J. Shaw	2	2	0
Eadie, Dr. A. W.	1	1	0
East Sussex Medico-Chirurgical Society	3	3	0
Eastwood, Dr. R. G.	1	1	0
Edington, Dr. J. W.	1	1	0
Edlington, E. H., Esq.	1	1	0
Elson, Dr. C. W. H.	2	2	0
English, Sir Crisp, K.C.M.G.	5	0	0
Evans, Dr. W. H.	1	1	0
Everidge, John, Esq., O.B.E.	5	0	0
Ewart, G. A., Esq.	1	0	0
Fairbank, H. A. T., Esq., D.S.O., O.B.E.	110	0	0
Fairley, N. Hamilton, Esq.	5	5	0
Fallows, Dr. H.	2	2	0
Fawkes, Dr. Marmaduke, O.B.E.	2	0	0
Feiling, Dr. Anthony	1	1	0
Fickling, E. L. Z., Esq.	1	1	0
Firth, Dr. Douglas	1	1	0
Fishmongers' Company	50	0	0
Fitzgerald, Miss	1	1	0
Fleming, A., Esq.	1	1	0
Footner, G. R., Esq.	10	0	0
Forsyth, Dr. W. L.	1	1	0
Fowler, Rev. A. H.	2	2	0
Fowweather, Dr. F. S.	1	1	0
Frankau, C. H. S., Esq., C.B.E., D.S.O.	2	2	0
French, J. Gay, Esq.	10	10	0
Frew, Dr. R. S.	5	5	0
Frost, Dr. W. Adams	1	1	0
Fry, Dr. H. J. B.	1	1	0
Gainsborough, Dr. H.	1	1	0
Galt, Dr. H. M.	1	1	0
Gard, E. L., Esq.	5	5	0
Gard, W. G. S., Esq., M.B.E.	5	5	0
Gibbes, Lewes N., Esq.	1	1	0
Gibbons, Dr. R. A.	10	0	0
Gilliatt, W., Esq.	5	0	0
Gillies, Dr. J. C.	1	1	0
Gilmour, Dr. W.	2	2	0
Gleave, Dr. H. H.	2	2	0
Gordon, Dr. J.	3	3	0
Gourlay, Dr. F.		10	0
Graham, Dr. N. C., *M.C.*	2	2	0
Graham-Smith, Dr. G. S.	1	1	0
Gray, H. Tyrrell, Esq.	100	0	0
Gregory, Dr. Hazel Chodak	3	3	0
Grey, Dr. F. Temple	1	1	0
Gye, Dr. W. E.	2	2	0
Haldin-Davis, Dr. H.	5	5	0
Hamilton, Dr. Louisa	2	2	0
Hare, Dr. Dorothy C., C.B.E.	5	15	0
Harris, Dr. Marjorie	1	1	0
Hartley, P., Esq., *M.C.*, D.S.O.	1	1	0
Harwood, Miss Sylvia Mary	10	10	0
Hawkyard, Dr. A.	1	1	0
Heald, Rev. B., M.A.		10	0
Heald, Dr. C. B., C.B.E.	5	5	0
Heaton, Dr. Charles J.	1	1	0
Hellier, Mrs.	2	2	0
Hepburn, M. L., Esq.	5	0	0
Hickman, Dr. E. M.	2	2	0
Hodder-Williams, Lady	105	0	0
Hodgson, Dr. H. K. Graham	5	5	0
Hollingsworth, H., Esq.	25	0	0
Holmes, Dr. Edwin	1	1	0
Hope, C. W. M., Esq., O.B.E.	5	5	0
Horder, Sir Thomas, Bt.	5	5	0
Hoskin, Dr. Jenner	5	0	0
Houston, Dr. T., O.B.E.	1	1	0
Howden, Dr. R.	1	1	0
Howitt, Dr. A. B.	5	0	0
Hudson, Arthur, Esq.	2	2	0
Hurry, Dr. J. Boyd	3	3	0
Hurst, Dr. E. W.	1	1	0
Inkster, Dr. R. G.	1	1	0
In Memory of an Old St. George's Man and O.E.	3	3	0
Jacob, Dr. F. H.	1	1	0
James, R. R., Esq.	3	3	0
Jameson, Dr. R. C.	1	1	0
Jamieson, Professor J. K.	2	2	0
Jepps, Dr. J. W. W.	1	1	0
Johnstone, Dr. W.	1	1	0
Joll, C., Esq.	2	2	0
Jones, Dr. E. Ll. Howell	1	1	0
Jory, N. A., Esq.	1	1	0
Jowett, Dr. R. E.	1	1	0
Kettle, Dr. E. H.	2	2	0
Kimber, Sir Henry Dixon, Bt.	200	0	0
King's College Hospital Lodge	10	10	0
Knowles, Dr. Marion	1	1	0
Laing, Dr. J. T. C.	10	10	0
Lamb, Dr. F. W. M.	1	1	0
Lancet, the Proprietors of the	105	0	0
Landau, Miss Muriel E.	1	1	0
Lawson, Dr. H.	1	1	0
Leathes, J. B., Esq.	2	2	0
Ledingham, Dr. J. C. G., C.M.G.	3	3	0
Lee, H., Esq.	1	1	0
Legg, T. P., Esq., C.M.G.	10	0	0
Lepper, Dr. Elizabeth, O.B.E.	2	2	6
Lodge, S. D., Esq.	1	1	0
Lovett, Dr. Nora A.	1	1	0
Lowry, Dr. Eleanor		10	6
Lush, Dr. Ronald W.		10	6
Lyle, H. Willoughby, Esq.	5	0	0
Lyndon, Dr. Arnold, O.B.E.	105	0	0
Lyon, Dr. D. M.	5	5	0
McColl, Dr. Daniel	1	0	0
McDonald, Mrs.	1	1	0
McDowall, Dr. R. J. S.	5	5	0
McEwen, P., Esq.	1	1	0
McGowan, Dr. J. P.	1	1	0
McIlroy, Professor Louise, O.B.E.	5	5	0
McIntosh, Dr. J.	2	2	0
McLeod, Dr. J. W.	5	5	0
McSwiney, Dr. B. A.	1	1	0
Manchester Medico-Ethical Society	5	5	0
Manchester Royal Infirmary Med. Board	100	0	0
Mann, Mrs. Caroline	1	1	0
Mapother, Dr. Edward	2	2	0
Maxwell, Dr. J. Preston	2	0	0
Mayo, Dr. F. H.	1	1	0
Melville, Dr. Stanley	2	2	0
Mercers' Company	100	0	0
Merchant Taylors' Company	105	0	0
Miller, Dr. A. H.	1	1	0
Miller, Dr. J.	2	2	0
Miller, Dr. Sinclair, D.S.O., *M.C.*	2	2	0
Mocatta, Miss Sybil G.	1	0	0
Muir, Dr. R.	5	5	0
Murray, Dr. E. G., O.B.E.	1	1	0
Murray, Dr. J. A.	2	2	0
Murray, Dr. R. Galway	1	1	0
Muschamp, Dr. R.	1	1	0
Nabarro, Dr. D. N.	1	1	0
Negus, V. E., Esq.	5	5	0
Nixon, Dr. H. T., M.B.E.	1	1	0
Norbury, L., Esq., O.B.E.	5	5	0
Oakeley, Dr. H. E. H.	2	2	0
O'Brien, Dr. R. A., C.B.E.	2	2	0
O'Kelly, Dr. W. D.	2	2	0
Oldfield, Professor C.	2	2	0
Oliver, Dr. V. L.	1	1	0
"One of the 50,000"	2	2	0
Orme, Dr. Gilbert E.	1	1	0
Panton, Dr. P. Noel	1	1	0
Parsons, Dr. L. D.	1	0	0
Pathological Society	10	10	0
Peake, Dr. Cicely	2	2	0
Pearson, Dr. A. E. A.	1	1	0
Pembrey, Dr. M. S.	1	1	0
Petrie, Dr. G. F.	2	2	0
Phear, Dr. A. G., C.B.	10	10	0
Phelon, Dr. H. V.	1	1	0
Physicians, Royal College of	105	0	0
Playfair, Dr. Ernest	5	5	0
Playfair, Hugh, Esq.	5	0	0
Polson, Dr. C. J.	1	1	0
Price, Miss Amy	2	2	0
Priestley, Dr. A. H.	1	1	0
Priestley, Dr. Dorothy P.	2	2	0
Pringle, Dr. G. L. K.	1	1	0
Pritchett, Dr. S. I.	1	1	0
Pryce, Dr. E. W.	1	1	0
Raper, Dr. H. S., C.B.E.	2	2	0
Rawlins, Dr. Morna	2	2	0
Robertson, Dr. H. M.	2	2	0
Robertson, Dr. Muriel	2	2	0
Rolland, Dr. W.	1	1	0
Rood, Dr. Felix	21	0	0
Rowden, Dr. L. A.	2	2	0
Rowden, Dr. W. H.	2	2	0
Ruston, Dr. E. T.	1	1	0
Ryrie, Dr. B. J.	2	2	0
St. George's Hospital Medical School	50	0	0
Scharlieb, Dame Mary, D.B.E.	2	2	0
Schwartzberg, Dr. M.	1	1	0
Scott, Dr. H. H.	1	1	0
Scott, Dr. T. O.	1	1	0
Scott, Dr. W. M.	1	1	0
Shaw, Dr. A. F. B.	1	1	0
Shennan, Dr. T.	1	1	0
Shiskin, Dr. Cecilia	1	1	0
Silk, Miss	1	1	0
Skinners' Company	100	0	0
Sladden, Dr. A. F. S.	1	1	0
Smith, Dr. F. B., *M.C.*	2	2	0
Smith, Dr. J.	1	1	0
Smith, Professor J. Lorrain	1	1	0
Smyth, Mrs.	1	0	0
Solly, Dr. R. V.	1	1	0
Sprigge, Sir Squire, M.D.	5	0	0
Stevenson, Dr. W. D. H.	1	1	0
Stewart, Professor Matthew J.	10	10	0
Stewart, W. R., Esq.	1	1	0
Surrey Branch of the B.M.A.	100	0	0
Susman, Dr. W.	1	1	0
Symons, H. W., Esq.	1	1	0
Taylor, Dr. A. L.	5	5	0
Teacher, Professor J. H.	2	2	0
Tetley, Mrs.	1,000	0	0
Thakore, Dr. M. D.	1	1	0
Thistlethwaite, Dr. W.	1	1	0
Thompson, Mrs.	1	1	0
Thomson, Sir StClair	10	0	0
Thomson-Walker, Sir John, O.B.E.	10	0	0
Topley, Dr. W. W. C.	2	2	0
Tudhope, Dr. G. R.	1	1	0
Tulloch, Dr. W. J., O.B.E.	1	1	0
Turnbull, Dr. H. M.	1	1	0
Veale, Dr. R. A.	1	1	0
Ward, Executors of Miss Ann	500	0	0
Ward, L. E. Barrington, Esq.	25	0	0
Wardill, W. E. M., Esq.	1	1	0
Wardle, Dr. G. Mary	1	1	0
Warnock, Dr. W.	1	1	0
Watterson, Miss Eleanor	1	1	0
Watts, Miss M. A.	1	1	0
Waugh, George E., Esq.	100	0	0
Webb, Dr. R. A.	1	1	0
Westminster Hospital and Medical School, Staffs of	100	0	0
Wheatley, Dr. Bertha	1	1	0
White, Dr. Eva	1	1	0
Whitfield, Dr. Arthur	10	0	0
Willcox, Sir William, K.C.I.E., C.B.	1	1	0
Willis, Miss F. R.		10	0
Wilson, G. E., Esq.	1	1	0
Wilson, Dr. G. H.	1	1	0
Wilson, Dr. H.	1	1	0
Wilson, Dr. W. J.	2	2	0
Wolfe, Dr. H.	1	1	0
Wormall, A., Esq.	1	1	0
Yelf, Dr. R. E. R.		10	0
Young, Mr. C. J.	1	1	0
Young, Dr. J. S.	1	1	0
Young, Dr. M.	1	1	0

As a result of contributions included in the above list names will be given to beds as under:

British Medical Association Charities Committee.
Fairbank, H. A. T., Esq., D.S.O., O.B.E.
Gray, H. Tyrrell, Esq.
Hodder-Williams, Lady.
Kimber, Sir Henry Dixon, Bt.
King's College Hospital Medical School.
Lancet, the
Lyndon, Dr. Arnold, O.B.E.
Manchester Royal Infirmary Medical Board.
Pathological Society of Great Britain and Ireland, Royal College of Physicians.
Royal Free Hospital Medical Staff.
St. George's Hospital Medical School.
Surrey Branch of the British Medical Association.
Tetley, Mrs. H. G.
University of Leeds.
Waugh, George E., Esq.
Westminster Hospital and Medical School Staffs.
Worshipful Company of Mercers.
Worshipful Society of Apothecaries.
In Memory of Dr. G. A. Wyon, Leeds University.

scholars, and the annual subscriptions and donations enable the council to pay for the foundation scholars, an extraordinary expense, such as the provision of a new sanatorium, cannot be met without the aid of special contributions. It is for this reason that we venture to appeal to your readers to help the council and make possible the provision of a sanatorium, built and equipped on the most modern lines, and worthy of a school a large proportion of whose scholars are the sons of medical men.

Donations received to date amount to £4,207 19s. 6d., but until at least £15,000 is in hand it will not be possible to proceed with the actual erection of the buildings.—I am, etc.,

RAYMOND CRAWFURD,
Chairman of Council of Epsom College.
WILLIAM HALE-WHITE,
Treasurer.
ARNOLD LYNDON,
Chairman, Sanatorium Committee.

THE ROYAL SOCIETY.

ANNIVERSARY MEETING.

THE anniversary meeting of the Royal Society of London was held, as usual, on St. Andrew's Day (November 30th), when the Council presented its report for 1927, and the President, Sir ERNEST RUTHERFORD, gave an address.

THE REPORT OF COUNCIL.

Research Appointments and Grants.

Deep regret was expressed on the death of the first of the Royal Society research professors, Professor E. H. Starling. He was, the report recalls, appointed Foulerton Professor on April 1st, 1922, and carried on his research in a suite of laboratories in the Physiology Institute of University College, London, to whom the Society was indebted for this hospitality to its professor. "Professor Starling carried out a series of important investigations, especially on the mechanism of renal secretion, the results of which have appeared from time to time in the *Proceedings*, and his laboratories became a centre of attraction and of fruitful activity for a large number of younger physiologists from this and other countries. The council have approved arrangements for the completion of the investigations on which Professor Starling was engaged by a group of these collaborators." The period of office for which Dr. H. W. C. Vines was appointed Foulerton Student expired this year, and Dr. R. J. Ludford has been appointed to the vacancy. For some years Dr. Ludford has been engaged in part-time investigation in general, physiological, and pathological cytology; the award of the studentship will now enable him to devote his whole time to research.

Sums amounting to £5,617 had been allotted from the Government grants for scientific investigations, and £1,000 had been placed in the hands of the Council to meet urgent demands. Of this amount £320 had already been allotted.

Tropical Diseases.

Researches into tropical diseases have been carried on by means of the Anonymous Bequest Fund under schemes recommended to the Council by the Tropical Diseases Committee. Notwithstanding the dangers and difficulties incident to the situation in North China, involving on some occasions serious personal risk to the Society's commissioner, Dr. Hindle, progress had been made with the investigation into kala-azar. A peculiarity of this disease in China appears to be the difficulty of infecting sand flies by feeding them on human cases. Dr. Hindle reported in November, 1926, that the workers of the China Medical Board had failed to obtain flagellates in phlebotomus fed on human cases, but that he and his co-workers had had two positive results out of a considerable series of experiments. These observations are in marked contrast with those obtained with *P. argentipes* fed on cases of Indian kala-azar; but, reporting in February of this year on the results of experiments on the development of Chinese leishmania, the Royal Society's Commission concludes that there is strong presumptive evidence in support of the view that *P. major*, var. *chinensis*, is concerned in the transmission of the parasite of kala-azar in North China. Dr. Hindle is now returning to this country, and it is hoped that further reports on the progress of the investigation will soon be ready for publicaion.

Dr. Grace, who is investigating filariasis and nephritis, arrived in Georgetown in December, 1926. After overcoming initial difficulties with regard to assistance and supplies, he is now working on the bacterial complications of filariasis and of chronic nephritis.

Finance.

During the year eight papers were published in the Mathematical and Physical Section, and eight in the Biological Section of the *Philosophical Transactions;* together these parts contain 831 pages of letterpress and 33 plates. Twenty-two numbers of the *Proceedings* have been issued; those in the Mathematical and Physical Section contain 2,724 pages, 92 plates, and three portraits; those in the Biological Section 780 pages, 44 plates, and sixteen portraits.

The Imperial Chemical Industries, Limited, has promised to subscribe £1,000 a year until further notice to help to meet the deficit on the publications account. In 1925 Sir Alexander Pedler bequeathed a portion of the residue of his estate to be used at the discretion of the Society for the advancement of chemical science. The amount realized yields an income of £170 a year; it will be used for the present to meet the expenses of publishing chemical and other papers by the Society. Thirteen applications had been received from societies for grants in aid of publication; eleven grants were made, the total sum allotted amounting to £1,700.

PRESIDENT'S ADDRESS.

The President, as is customary, began his address by speaking of the Fellows who had died during the year.

E. H. Starling.

Of Professor E. H. Starling, who was the first of the Royal Society's research professors, he said:

"For more than thirty years Starling has been recognized as an outstanding figure in physiology, and the investigations which he carried out with energy and enthusiasm have effected a clarification of knowledge and a new orientation of ideas concerning a succession of the most important functions of the body. His earliest studies, made like so many later ones in co-operation with his great friend and scientific partner, the late Sir William Bayliss, were directed to analysis of the action of the mammalian heart. Though his activities were for many years diverted to other problems, his interest in the heart and the factors regulating its function remained with him always, and became again effective in his later years in a series of masterly researches. These he carried out, with a succession of able colleagues and pupils, on the mammalian heart, isolated by a method of his own devising from the vessels of the major circulation, and performing its function under conditions which allowed the rate at which the blood entered the heart, and the resistance encountered in its ejection, to be artificially controlled—the well-known 'heart-lung preparation.'

"In the intervening years he had completed and published, largely with Bayliss, a series of researches in which the physical laws governing filtration, diffusion, and osmosis through membranes were applied to explain the formation and absorption of lymph. There followed further co-operative investigations with Bayliss on the movements of the intestinal walls, their co-ordination by the local nervous plexuses and their general control by the central nervous system, and then—most famous, probably, of all their joint researches—their work on the stimulation of pancreatic secretion following the discharge of the stomach contents into the small intestine. This led to the discovery of 'secretin' and the formation of general conceptions of the control of bodily functions by chemical messengers or 'hormones,' embodied in Bayliss and Starling's joint Croonian Lecture before this Society.

"During the war and the years immediately following it Starling gave his whole energies to the service of the State, as director of investigations on defence against chemical warfare, as chemical adviser to the army at Salonica, and later as chairman of the Royal Society's Food Committee, scientific adviser to the Ministry of Food, and British scientific delegate to the Interallied Food Commission.

"When his thoughts and activities were at last free to return to their own natural channels, he began a large and exacting series of investigations in which he combined some of his earlier methods to study the formation of urine under conditions artificially controlled and varied. These researches, with many which grew from them, he continued to prosecute during his tenure of the Foulerton professorship. He enjoyed the assistance and collaboration of a succession of able colleagues and of visiting workers from many countries, eager to learn his methods and to imbibe his ideas. It might have been hoped that the new conditions of freedom from the responsibilities of administration and formal teaching would have enabled him to conserve his

physical powers; but Starling's restless energy and burning enthusiasm forbade all thought of relaxation, till at length a physique, weakened by illness, broke under the strain.

"By Starling's death the Royal Society has lost not only a great investigator who has rendered one of its chairs illustrious by his brilliant record of research as Foulerton professor, but a Fellow who has been generous of efficient service to the Society on its Council and its committees, who has been proud of its traditions and jealous for its fame and prosperity. He was awarded a Royal Medal in 1913. In and beyond this Society he was a stalwart champion of the claims of research and of the interests of his scientific colleagues. Physiology, above all, was the central interest and enthusiasm of his life. In its faithful and single-minded pursuit he had always one end in view: this, to quote from his own beautiful Harveian Oration, was 'to attain to a comprehension of the "wisdom of the body and the understanding of the heart," and thereby to the mastery of disease and pain, which will enable us to relieve the burden of mankind.'"

William Einthoven.

William Einthoven, the President said, for forty-two years professor of physiology in the University of Leyden, and Nobel Laureate in Medicine, was elected a Foreign Member of the Society in 1926.

"His long scientific career was devoted to the invention and perfecting of physical apparatus of the greatest delicacy and precision for the record and analysis of processes occurring in the living body or having a physiological interest. His string galvanometer, originally devised for recording the fleeting electrical changes which accompany the different stages of the beat of the heart, and now in world-wide use in hospitals as well as physiological laboratories, has also found application in a wide range of purely physical investigations."

Other Deceased Fellows.

The President also referred to the deaths of Sir Arthur Shipley, well known for his contributions to parasitology, who had been for seventeen years before his death Master of Christ's College, Cambridge; of Professor Svante Arrhenius (foreign member), director of the Nobel Institute in Stockholm, who in 1899 published his famous paper on the theory of ionic dissociation to explain the properties of electrolytes; and of A. A. Lawson, professor of botany in the University of Sydney, who was a selected candidate for the Fellowship, but died before the date of formal election.

Sir Ernest Rutherford next discussed the causes for the sparse attendance at the ordinary meetings of the Society; it had been hoped to improve it by grouping the papers, but this had not met with much success. In the early days of the Society it had been customary to perform experiments before the Fellows, but this custom had gradually fallen into abeyance; it was proposed to revive it. Portable demonstration tables had been placed in the tea room with connexions for water, gas, and electric current. It was thought that in every branch of science, but particularly in the biological sciences, there must be many simple experiments and preparations which could be readily shown in such an extemporized laboratory; such demonstrations would be of interest not only to the specialist, but to the Society in general.

Sir Ernest Rutherford then turned to a review of the results of investigations carried out in recent years to produce intense magnetic fields and high voltages for general scientific purposes. In concluding his address he referred to the medals awarded on this occasion.

The Copley Medal.

Of the recipient of the Copley Medal, Sir C. S. Sherrington, O.M., he said:

"Sherrington early chose as the special field of his investigations the physiology of the central nervous system. To this, during some thirty years, he has steadily devoted his great skill in experiment, bringing the immense complexities of its function within the range of objective analysis, and revealing fundamental plan and orderly sequence in the reflex actions by which it controls the activities of the body, and continuously adjusts them to the environment. The results of this work have been embodied in a series of some two hundred original memoirs, presenting a continuous record of progressive investigation. The earlier stages have been brought under review and treated synthetically by Sherrington in his now famous Silliman lectures on 'The integrative action of the nervous system.' In these he deals with the occurrence and significance of the muscular rigidity which appears when the higher brain is removed, with the co-ordination of muscular movements by reciprocal excitation and inhibition of antagonistic muscles, with the rhythmical, phasic activity which the conflict produces in the centres concerned with certain movements, and with the appearance of a purposeful character which the integrating action impresses on many forms of reflex response. During more recent years our own *Proceedings* have borne steady witness to the progress made in the finer analysis of the functions of the central nervous system by Sherrington himself and by pupils using the methods which he has created, and building on the foundations which he has laid.

"The influence of Sherrington's investigations has spread far beyond the limits of his own laboratory and has inaugurated a new era in neurological investigation throughout the world. In this connexion we may fittingly pay a tribute to the memory of one of the most eminent among those who have drawn inspiration from Sherrington's work and from personal contact with himself. Rudolph Magnus of Utrecht, whose early death in this year the whole world of science deplores, found there the impulse to his own original and far-reaching investigations, the results of which he embodied in the Croonian lecture to this Society two years ago, on 'Animal posture.' In every civilized country, in the neurological clinic as well as in the laboratory of physiology and of experimental psychology, the influence of Sherrington's work is felt, giving the clue to the understanding of many of the motor symptoms of nervous disorder, and holding out promise that even the higher functions of the central nervous system will not remain permanently beyond the reach of man's experimental inquiry."

The Royal Medals.

Of Sir Thomas Lewis, to whom one of the Royal Medals has been awarded, he spoke as follows:

"From 1911 onwards to the present day, Sir Thomas Lewis has taken a leading part in the remarkable growth of our knowledge of the mammalian heart-beat, which has been one of the conspicuous scientific achievements of the period in question. Until he began his work nothing was known for certain as to the relation of the specialized structures known to anatomists to the origin and propagation of the beat of the heart. Lewis's researches enabled him to locate the point of origin of the beat, and to plot out the course of the wave of excitation over the ventricles and auricles of mammals. By extending these observations to the hearts of representative vertebrates he was able to compare the modes of spread of the wave with the special forms of the electro-cardiogram, and thus to appreciate clearly the meanings of the several deflections. Further extension to diseased hearts led to the interpretation of the abnormalities of the electro-cardiographic record.

"In 1911 Lewis was able to show that, as Cushny had previously suggested, certain cardiac irregularities are due to fibrillation of the auricles; and his later clinical and experimental work on auricular fibrillation and flutter suggest that the irregularities are due to the formation of an endless circulating wave of contraction in the auricles. In this special field of physiology and pathology, of such great importance to medicine, Lewis's researches have replaced a mass of scattered, suggestive observations by a coherent and established theory. His book on this subject, which is necessarily based, to a large extent, upon his own observations, is recognized as authoritative throughout the world.

"Quite recently Lewis has published another book which embodies the results of investigations of the peripheral circulation, upon which he has been engaged during the past twelve years. The response to other kinds of stimulus closely resembles that invoked by injection of histamine into a puncture, and Lewis produces strong evidence that even the response to pressure is due to the liberation in the tissue of a chemical compound, which, if not actually histamine, resembles that substance very closely in its physiological effects.

"In these investigations, which may be taken as models for the application of exact methods to human physiology and pathology, Lewis shows the same qualities of accurate experimentation and exact reasoning which are so conspicuous in his work upon the heart's action."

The Buchanan Medal.

Of Professor Major Greenwood, to whom the Buchanan Medal is presented, he said:

"Dr. Greenwood, Medical Officer (Medical Statistics), Ministry of Health; Professor of Epidemiology and Vital Statistics, University of London (London School of Hygiene); Chairman of the Medical Research Council Statistical Committee, and Statistician to the Lister Institute, is specially distinguished for the statistical study of medical subjects, having applied the statistical method to the elucidation of many problems of physiology, pathology, hygiene, and epidemiology. He has been pre-eminent in encouraging and developing the use of modern statistical methods by medical laboratory investigators and in securing the adequate planning and execution of field investigations. He is almost unique in possession of both the medical knowledge and mathematical ability which are essential in these researches. Dr. Greenwood is the author (with Professor E. L. Collis) of a book on *The Health of the Industrial Worker*, and of numerous biometric studies dealing with the causation, prevention, and treatment of disease."

The Hughes Medal.

The Hughes Medal has been awarded to William David Coolidge, a distinguished member of the scientific staff of the General Electric Company of America. Of him the President said:

"Science is under a great debt to Coolidge for the invention and production of a new type of *x*-ray tube, called by his name, of great flexibility and power, which has proved of great service not only to medical radiology, but in numerous scientific researches. In the last few years he has applied his unrivalled technical knowledge to the generation of high velocity cathode rays, which can be passed into the air through a thin window, as in Lenard's pioneer experiments thirty years ago. Such researches are of great importance to science, as they promise to provide us with new methods of obtaining a copious supply of swift electrons and high-speed atoms of matter for experimental investigations."

British Medical Journal.

SATURDAY, DECEMBER 3RD, 1927.

THE ASSOCIATION IN 1927.

MEDICAL practitioners who, for reasons that may seem good to them, are not now members of the British Medical Association, and final-year students who hope soon to become qualified, would do well to study the middle pages of the SUPPLEMENT to our present issue, where they will find a brief account of the aims of the Association, its work and organization, and of the privileges and responsibilities of membership. If figures speak more forcibly to them than words, they should turn to the chart showing graphically the number of members in each year since 1877. A total membership to-day of 33,600, and a net increase of more than 13,500 since the war, are facts of the kind that point their own moral. Continued growth year by year, not only at home but throughout the British Empire, is a sign of vigorous life in an organization now nearing its hundredth anniversary. There are other standards of success, and the Association is very willing to be judged by them, though the work it does for the individual doctor, for the profession at large, and for the public cannot be measured by simple tests and put down in a diagram. The occasion may, however, be taken to look back over the year that is closing and recall some of the manifold ways in which the Association in 1927 has tried to fulfil its duty.

The first of the three main objects of the British Medical Association is to promote the medical and allied sciences; the second is to uphold the honour and interests of the profession; and the third is to encourage good feeling among its members. These sides of its work—scientific, political, and social—are organized on distinct lines, but are not sharply cut off, and at the Annual Meeting they overlap a good deal, both in space and time, with benefit to all. The Annual Meeting is the central event in the Association's year, and by general consent the great professional gathering in Edinburgh last July, under the presidency of Sir Robert Philip, was one of the most interesting and most enjoyable ever held. The Scottish capital, with its historic associations, its natural and architectural charm, and its world-renowned medical school, is an ideal place for a medical congress, and the celebration of Lister's centenary there during the same week added to the interest of the occasion. Full reports of the proceedings in the scientific sections at Edinburgh have appeared in our columns during the past four months, and we hope soon to complete their publication. These important papers and debates, however, are only part of a great volume of work on behalf of medical science carried out during the year through the machinery of the Association. Clinical meetings have been held periodically by many Divisions and Branches at home and abroad; lectures on medicine, surgery, and obstetrics have been given for the Association in various parts of the country by leaders of the profession; the Library has responded to the growing demand upon it from members up and down the country; prizes, scholarships, and grants in aid of research have been awarded by the Council on the advice of the Science Committee; and encouragement has been given to post-graduate education and to collective inquiries into everyday problems of practice. Since all these phases of the Association's work for science have been reflected in our columns month by month, it may be worth noting that in 1927 this JOURNAL completed its seventieth year of publication under the title *British Medical Journal*, and the eighty-seventh year of its life as the weekly organ of the Association.

In support of the honour and interests of the profession the Association has been no less active than in the promotion of science. To secure in every field of medical practice the conditions essential to the provision of an increasingly effective service to the community; to improve old and find out new methods of co-operation between the profession and the numerous statutory and voluntary bodies which minister to the common health; and to preserve through every fluctuation of the changing social order and in all schemes for extended health services the economic basis of medical efficiency—this is a task which could be undertaken successfully by no smaller or less representative body than ours. Hence the importance of ensuring that the voice of every section of the medical profession has its due weight in the counsels of the Association, and the significance of the new scheme allowing for a special form of group organization where this seems to be called for. Nor must it be forgotten that through the Overseas Branches the experience of the parent body is made available for our colleagues in the Dominions and Colonies. The Australian Federal Committee, in tackling the problem of health insurance, profits by the hard-won wisdom of insurance practitioners in Great Britain, and lends that wisdom to the Federal Government. The Medical Association of South Africa finds the path to professional solidarity in the Union within the British Medical Association, under a constitution adjusted to modern needs by a long process of evolution. The medical services in the Crown Colonies profit by the Association's experience of hospital problems, as well as by the existence of a body able to take up service difficulties with the Colonial Office.

In the field of health insurance at home, where the Insurance Acts Committee's scheme for a revised disciplinary machinery marks a definite stage in the development of the national system; in the struggle to free English lunacy law from the bonds of the ignorant suspicion which hinders adequate treatment of the sick in mind, and exposes the doctor to harassing persecution in the discharge of his duties towards the patient; in schemes for the reform of the Poor Law; and in many other directions, the Association has met increasing calls upon its resources, and will continue to find an ample field of service to the public and the profession. A scheme for making more effective its contribution to public education in health matters was approved at Edinburgh; the formulation of a middle-class hospital policy has been undertaken; and a comprehensive review of the relations between private practice and the health services offered to the public by statutory and voluntary bodies has been begun. The increasing proportion of public health appointments advertised at the Association's scale rates of salary is the justification of a policy endorsed in 1925 not without doubt and anxiety.

As in the arena of public policy, so in the promotion of individual interests the work of the Association has gone forward. The sweetening of professional relationships through friendly advice and arbitration in

cases of dispute is part of the daily routine of the Association's headquarters; so, too, is intervention to protect holders of salaried medical posts from arbitrary action on the part of employing bodies, and advice in all the perplexities of professional life. Through the Medical Insurance Agency, which has its offices in the Association's House and receives much other assistance from the Association, and now through the British Medical Bureau and an increasing volume of medical agency work undertaken by local bureaux under the auspices of Divisions and Branches, the more material interests of members are cared for, whilst through the efforts of the Charities Committee a step at least has been taken towards the removal of a standing reproach to the profession.

The work of the British Medical Association is not to be defined or evaluated within the compass of a brief review. If we have conveyed any impression of its nature and scope it will be clear that the social activities of the Association are the natural outcome of fellowship in such service as it renders to the profession and to the public. This fellowship is in itself the best guarantee of the healthy professional spirit which for ninety-five years the Association has sought to maintain.

THE MEDALS OF THE ROYAL SOCIETY.

THE award this year of three of the chief medals in the gift of the Royal Society to members of our profession makes this an *annus mirabilis* for British medicine. The names were mentioned here three weeks ago, and the President, Sir Ernest Rutherford, in his address at the anniversary meeting of the Society on St. Andrew's Day (p. 1038), stated the reason for the selections in terms which must give the greatest pleasure, not only to the recipients, but to all of us. The work of both Sir Charles Sherrington and Sir Thomas Lewis, though physiological, has been so precise and conclusive—so clean-cut—that it has at once found application to clinical medicine, while Professor Major Greenwood has with mathematical acumen helped perhaps more than anyone to induce a cool and calm study of vital statistics.

Although no medal is given with it, it may be permitted to mention here that a Conway Evans Prize has been awarded this year. Dr. Conway Evans, who was a Member of the Royal College of Physicians and medical officer of the Strand District, died in 1892, bequeathing the residue of his estate in trust to the President of the Royal Society and the President of the Royal College of Physicians, directing that the proceeds should be given from time to time to some person who, in their opinion, has made some valuable contribution or addition to science. The fund was transferred into the trust of the Presidents in February, 1925. The testator gave to the Presidents full discretion as to the date and amount of any award, and they have now agreed that the first award, amounting to 500 guineas, shall be made to Sir Charles Sherrington; this decision was announced at the anniversary dinner on November 30th.

The awards this year recall to us once again the great services the Royal Society, holding the balance with stern impartiality, has rendered, and continues to render, to mankind in general and our race in particular. In its early days the Society, notwithstanding the patronage of King Charles II, was the object of much ridicule by the would-be wits of the day, and even so great a writer as Jonathan Swift condescended in his Laputa to satirize and scoff at its early investigations. More than a century later the inimitable Boz seems to have thought the British Association fair game for his broad humour when he cast ridicule upon the doings of the Mud-fog Association. But neither Swift nor Dickens could harm the subjects of their misplaced humour; they have since flourished exceedingly.

The Royal Society of London—to give it its full title—does not now concern itself directly with the arts of medicine or surgery. Its honours are given for good and original work in any science, but on work of this order all progress in the healing art ultimately depends. As physiology and anatomy are closely associated with medicine, and constitute, indeed, what used to be called "the institutes of medicine," it is not surprising that among the recipients of the medals awarded by the Society a number of members of our profession should be found. This year, indeed, we have our full share. Sir Thomas Lewis receives a Royal Medal "for his researches upon the vascular system following upon his earlier work on the mammalian heart-beat"; Sir Charles Sherrington the Copley Medal, the greatest honour that the Society has in its gift, "for his distinguished work on neurology"; and Professor Major Greenwood the Buchanan Medal "for his statistical researches and other work in relation to public health." All of these honours have been thoroughly well earned and worthily bestowed, and their recipients have our warmest congratulations. Yet another medal has been awarded for work in a department of science which has of late years come so closely to concern medical and surgical practice, and although its recipient, Mr. William D. Coolidge, is not a medical man, his name has become a household word among radiologists and all those who are concerned in any way with *x* rays. It is "for his work on the *x* rays and the development of highly efficient apparatus for their production" that the award of the Hughes Medal is made.

The history of the medals of the Royal Society is of some interest. For the first forty-seven years of its existence the Society, like Kipling's Fuzzy-Wuzzy, "hadn't got no medals nor rewards," for it was not till the year 1709 that one of its Fellows, Sir Godfrey Copley of Sprotborough, Yorkshire, baronet, dying, bequeathed to Sir Hans Sloane, Bt., and Abraham Hill, Esq., the sum of "one hundred pounds in trust for the Royal Society of London for improving natural knowledge to be laid out in experiments, or otherwise for the benefit thereof as they shall direct and appoint." We do not suppose that Sir Godfrey Copley had any motive in this bequest less worthy than a love of science and of the Society to which he had for many years belonged, but if he had intended to make his name illustrious for centuries he could hardly have chosen a better or surer way of doing so, even had he instead adopted Hamlet's advice to build churches. For twenty-six years the interest of the bequest was given to the curator of the Society, Dr. (of laws) Desaguliers, for various experiments made before the Fellows, a practice now to be revived in a modified form. In 1736, however, it was applied to purchase a gold medal to be awarded to the author of the most important scientific discovery or contribution to science by experiment or otherwise, "not confining the benefaction within the narrow limits of any particular country, much less of the Society itself." With few exceptions a Copley Medal has been awarded every year since 1736. Compared with the Royal Medal, the Copley has not been bestowed upon many medical men. In 1787 John Hunter received it for his papers on the ovaria and on the identity of the

dog, wolf, and jackal species, and on the anatomy of whales. It was awarded to Astley Paston Cooper in 1801 for a research into the effects of the destruction of the membrana tympani of the ear. Everard Home and Benjamin Brodie both received the honour, as did Richard Owen. Joseph Lister had it in 1880, Sir Joseph Hooker in 1887, and T. H. Huxley in 1888. Sir E. Sharpey-Schafer was given this medal in 1924, and Sir F. Gowland Hopkins received it last year. It may be noted that in 1864 it was awarded to Charles Darwin, whose doctrine has so profoundly influenced the progress of medicine.

The reputation of King George IV has of late years somewhat improved under the treatment of annalists, but it is still not such as to be able to dispense with any credit that can be attached to his name. Therefore it seems well to recall attention to his good deed of instituting the Royal Medals of the Society. It is probably but a coincidence that the two most hedonistic kings since the Tudors should have sought to benefit science. Charles II seems to have been easy-going and good natured when his own pleasures were not interfered with, and to have been stirred at times by curiosity as regards natural phenomena. What good influence induced George IV to found the Royal Medals we know not, for there is no evidence that he took any interest in experiments or inquiries in natural philosophy. Be that as it may, in the year 1825 Sir Humphry Davy, then President of the Royal Society, received a letter from Sir Robert Peel announcing His Majesty's intention "to found two gold medals of fifty guineas each, to be awarded as honorary premiums under the direction of the President and Council." Resolutions were shortly after carried by the Council in accordance with the King's wishes, but when in 1830 he died no medals had yet been forthcoming, nor their equivalent in money. The foundation lapsed on the demise of the Crown, but King William IV restored it, and at length in 1833 the ten Royal Medals in arrear were distributed, the first having been awarded in 1826 to John Dalton for his work on the atomic theory. There were neither awards nor medals for the years 1831 and 1832, during which the original foundation had lapsed and King William had not yet restored it. His foundation was not retrospective, and the series of awards began afresh in 1833 with A. P. De Candolle, the botanist, and J. F. W. Herschel, the astronomer. Since that date two Royal Medals have been awarded every year, the foundation having been restored by each successive sovereign on his accession. Awards of these medals are submitted by the President and Council to the King for his approval before they are announced.

A number of members of the medical profession have been honoured with these medals, generally speaking for researches in physiology or (less often) pathology. In 1829 Charles Bell received a Royal Medal for his work on the nervous system, in 1839 Dr. Martin Barry received it for his demonstration of spermatozoa in the ovum, and in 1842 William Bowman for his work on the kidney. Among many subsequent awards were those to Richard Owen, Benjamin Brodie, T. H. Huxley, Joseph Hooker, W. B. Carpenter, Lockhart Clarke, G. J. Allman, Joseph Lister, W. H. Flower, Burdon-Sanderson, David Ferrier—a veteran who is still spared to us—and Victor Horsley. Professor Sharpey-Schafer received the medal in 1902, and Sir C. S. Sherrington, who now is awarded the Copley, was given the Royal Medal in 1905. Henry Head, Ronald Ross, W. M. Bayliss, G. Elliot Smith, E. H. Starling, J. S. Haldane, and H. H. Dale were worthy predecessors of Sir Thomas Lewis, the latest medical Royal Medallist.

The Buchanan Medal, which is well earned by Professor Major Greenwood, has a much shorter history than those above named. It is a gold medal of the value of £20 provided by a fund of £276 10s. raised in 1894 in honour of Sir George Buchanan, principal medical officer of the Local Government Board, who died in 1895. It is awarded every five years for distinguished service in hygienic science and practice. The first medal was given by the subscribers of the fund to Lady Buchanan. Subsequent medallists have been Sir John Simon, M.D., Drs. Monckton Copeman and William Henry Power, Surgeon General Gorgas, Sir Almroth Wright, and Sir David Bruce.

The Hughes Medal commemorates David Edward Hughes, who died in 1900 and left between £300,000 and £400,000 to London hospitals. He was the inventor of a type-printing telegraph, of the microphone, and of the telephonic induction balance. The medal bearing his bust is awarded annually, together with the balance of the income of the fund, which is a substantial amount, as the reward of original discovery in the physical sciences, particularly electricity and magnetism. The Royal Society has also in its gift the Rumford, Darwin, Davy, and Sylvester Medals. The first-named was founded in 1796 for research into heat and light by Sir Benjamin Thompson of Rumford, New Hampshire, an American loyalist who was driven out of New England and became a count of the Holy Roman Empire after long serving the Elector of Bavaria. He is perhaps best known as the founder of the Royal Institution. The Darwin Medal, which is accompanied by a grant of £100, is given every alternate year "in reward of work of acknowledged distinction (especially in biology) in the field in which Mr. Darwin himself laboured." A. R. Wallace, Sir Joseph Hooker, and Professor T. H. Huxley, Darwin's lifelong friends, were awarded the first three medals. Later recipients have been physiologists and comparative anatomists, but not medical practitioners. The Davy Medal is given for chemical, and the Sylvester for mathematical, research.

HYPOGLYCAEMIA.

THE intensive study of blood sugar that was initiated by the discovery of insulin has revealed a bewildering number of substances that can produce hypoglycaemia. In 1923 Collip[1] showed that a substance which he named glucokinin could be obtained from a great variety of plant tissues. This substance reduced the blood sugar in normal and in depancreatized animals. Collip suggested that it was a plant hormone that played an essential part in the carbohydrate metabolism of plants. Peptones have recently been shown[2] to contain a substance which can produce hypoglycaemia; but the activities of peptones from different sources vary enormously. These results are of interest in view of the recent claims made on behalf of bilberry-leaf extract. This was shown by Mark and Wagner[3] to reduce alimentary glycosuria and hyperglycaemia in dogs, and also to reduce glycosuria in diabetic patients. The substance was named myrtillin. Allen[4] has studied the properties of this substance, and has found it to produce striking and uniform benefit in diabetic dogs, and has also found that its use in human diabetics permits great reductions of the dose of insulin. Myrtillin is equally efficacious if given by mouth or subcutaneously, and even the largest doses are

[1] Collip: *Journ. of Biol. Chem.*, 56, 513; 57, 65; 58, 163, 1923.
[2] Levine: *Proc. Soc. Exp. Biol. and Med.*, 24, 744, 1927. Menten and Manning: *Journ. of Biol. Chem.*, 92, 253, 1927.
[3] Mark and Wagner: *Klin. Woch.*, 4, 1592, 1925.
[4] Allen: *Journ. Amer. Med. Assoc.*, 89, 1577, 1927

stated to be non-toxic. Allen states, however, that a considerable proportion of failures must be expected, especially in the severest cases and in young patients. The Council of Pharmacy of the American Medical Association has published a preliminary report.[1] This report is very guarded in its statements, but points out that no satisfactory method of standardization has been evolved. This is important, because the chemical nature of myrtillin is unknown, and it has not yet been obtained in a pure state. General interest in the possibility of reducing the blood sugar in diabetes by oral administration of drugs has been increased during the last year by the introduction of the substances "synthalin" (Frank) and "glukhorment" (von Noorden). About this last-named substance Dr. Dale and Professor von Noorden have a curious story to tell this week (p. 1027). A considerable literature has already arisen about synthalin and myrtillin, and there seems to be a general agreement that they will frequently reduce glycosuria and hyperglycaemia in mild cases of diabetes. On the other hand, many observers have reported a rather alarming frequency of toxic symptoms, particularly in the case of synthalin. There appears, therefore, to be a wide range of substances obtainable from vegetable and animal tissues that can reduce the blood sugar both in normal and diabetic subjects. Several of these substances appear to produce benefit when given by the mouth in mild cases of diabetes. In no case, however, has any substance been found which can rival insulin either as regards potency or certainty of action.

[1] (Report) *Journ. Amer. Med. Assoc.*, 89, 1607, 1927.

EPSOM COLLEGE SANATORIUM.

RATHER less than a year ago we referred in a leading article (December 18th, 1926, p. 1187) to the need of providing a modern sanatorium for Epsom College, and more adequate isolation accommodation. Attention was called to the regrettable fact that the only public school which has as a primary aim the provision of special facilities for the sons of medical practitioners is demonstrably behind the times as regards its equipment for dealing with epidemic outbreaks. Moreover, the building at present in use is ill adapted for the purpose of treating illness on modern lines in an economical way. The successful efforts made during recent years to raise the standard of the school teaching to the highest level have resulted in an increased entry of boys, which has, however, accentuated the need of better sanatorium facilities, and might have led to serious consequences had not the school preserved its excellent record as regards health. We publish at page 1035 of this issue an illustrated description of the new sanatorium, which will contain twenty beds for non-infectious cases and thirty beds for infectious cases, with ample accommodation for the nursing and domestic staff. Those familiar with the college will realize that in designing the building care has been taken to choose the best available site in order to secure economical administration and the full employment of such natural therapeutic agencies as sunlight and fresh air. A combination in one block of sanatorium and isolation departments is a commendable feature, and the danger of infection is met by providing separate entrances and exits for the two divisions. The cost of the building is expected to be £26,600, a little higher than was previously estimated. Towards this a sum of over £4,000 has already been received, and a list of donations appears at page 1037. At least £15,000 is required before the actual work of building is begun, and in this connexion we hope that the letter published at page 1035 over the names of Dr. Raymond Crawfurd, chairman of the council of Epsom College, Sir William Hale-White, the treasurer, and Dr. Arnold Lyndon, chairman of the Sanatorium Committee, will be read with sympathy and kindle a generous and speedy response. Donations to the "Sanatorium Fund" should be sent to the secretary at the Epsom College office, 49, Bedford Square, W.C.1.

PHARYNGEAL AND LARYNGEAL POUCHES.

AT a meeting of the Royal Physical Society of Edinburgh on November 21st Dr. Douglas Guthrie read a paper on "Pharyngeal and laryngeal pouches in man and animals." Pockets ("ganahs") were, he said, sometimes artificially produced by criminals in India, by means of a lead disc attached to a string; it was retained in position continuously, and served to deepen the normal hollow (sinus pyriformis) at the entrance to the larynx, and the pouch which was thus gradually formed became a safe hiding place for coins or precious stones. This pouch differed in site and origin from the pharyngeal pouch, or diverticulum, which occasionally developed behind the larynx; the latter was of the nature of a hernia, and sometimes demanded surgical attention. It was interesting to note that in the pig a pouch was normally present at this point in the posterior pharyngeal wall, but no such structure was found in other domestic animals. Other pouches, such as those found within the larynx, were of interest to the comparative anatomist. In man there was a depression, the laryngeal ventricle, just above each vocal cord, and from this a little pouch or saccule extended upwards for a variable distance. In the gorilla and chimpanzee this extension, uniting with its neighbour of the opposite side, reached as far as the root of the neck; in other monkeys the two united saccules occupied a large cavity in the hyoid bone. Absent in the sheep and ox, the ventricle and saccule were found in the dog and pig, while in the horse the saccular part was relatively large. Advantage was taken of this fact in the operation of ventricle-stripping to cure "roaring" in horses. The function of laryngeal pouches was uncertain. They might serve to lubricate the vocal cords or might act as resonating chambers, or might simply be the degenerate remains of the accessory air reservoirs, such as exist in the frog and in birds. The communication was illustrated by specimens and lantern slides, and by a series of casts showing the shape of the saccule in various species.

THE AUTOBIOGRAPHY OF AN ACROMEGALIC.

BOOKS descriptive of their own maladies by medical authors are not numerous. Some years ago Dr. Edward Liveing, who suffered from migraine, wrote a book which is a classic on that subject, and in 1912 Dr. Leonard Mark produced a notable work entitled *Acromegaly, A Personal Experience*,[1] and to it he has recently added a sequel under the title of *The Apologia of an Acromegalic*.[2] Taken together these two publications give a pretty full account of the life of a man of ability who has now passed the proverbial three score and ten years, and has suffered from symptoms of acromegaly, at that time unrecognized, since the age of 24. Apart from its medical interest, Dr. Mark's book will always be valuable as the record of the career of a member of the professional class, who was brought up till the age of 20 in the South of France, and has since lived in London and shared in its medical life. It is of interest to note that, despite many distressing symptoms, Dr. Mark did not himself recognize the nature of his trouble until years after it was obvious to his medical friends, and after Dr. Pierre Marie, who first described the disease, had picked him out from a crowd of bystanders as a typical acromegalic. Dr. Mark tells us in his last paper that when, in 1912, his book was published he looked upon it as his swan-song, and anticipated an early death. Now, fifteen years later, he accepts the opinion, given by

[1] London: Baillière, Tindall and Cox.
[2] *Medical Press and Circular*, October 5th and 12th, 1927.

Sir William Osler in 1919, to the effect that the disease had then ceased to progress, and that he was suffering only from the effects of the permanent changes produced by it. But Dr. Mark has not been content with the study of his own case alone. He gives much interesting information on the disease as he has observed it in others, and on cases in the London Poor Law infirmaries; he has written an account of the "Governor" of Scarborough Spa 200 years ago, whom he has satisfied himself, from pictures and descriptions, was an acromegalic. Dr. Mark does not, it seems, regret that he was born rather too late to profit by the operation devised and carried out by Professor Harvey Cushing, for, as he asks, "Who can tell whether to-day I am better off?" We congratulate Dr. Mark upon his unconquerable soul, and on the pluck with which, through half a century, he has fought his disabilities and made his disease a subject for interesting investigation and study. Long may he survive to take those omnibus rides into the suburbs which he has found so refreshing, and may his closing aspiration, in the form of the following quotation from Montaigne, find fulfilment in the end: "I would have a man to be doing, and to prolong his life's offices, as much as lieth in him, and let death seize upon me, whilst I am setting my cabiges, carelesse of her dart, but more of my imperfect garden."

BRILL'S DISEASE AT MARSEILLES.

FOR the last three or four years the Mediterranean coast of France, especially in the neighbourhood of Marseilles, has experienced an infectious exanthematous epidemic of an unusual kind. Reports on this disease have been made to the Académie de Médecine in Paris by physicians of Marseilles—one by Dr. Olmer, presented to the Académie on July 12th, and another by Drs. Boinet and Jean Pieri, which is published in the *Bulletin de l'Académie de Médecine* for October 4th. There appears to be a common opinion that the disease is a benign form of typhus, similar to the outbreak in New York in 1898, to which the name Brill's disease was given. In Marseilles it has attacked persons in all classes of life and in many different neighbourhoods, but it has been rare to find several patients in one house. Some of the patients had been in contact with foreigners, especially with Orientals. The infection could not be traced to parasites; the sick persons were quite free from lice. The results of bacteriological investigations were negative; agglutination to *proteus* X^{19} of Weil-Felix never occurred. The onset is sudden, with headache and rapid rise of temperature. Sometimes there are abdominal pains and foetid diarrhoea. The throat becomes reddened as in scarlet fever, and small ulcers may form on the pillars of the fauces. The rash appears about the third day; it begins on the lower extremities, and extends upwards until it reaches the face. It consists of numerous spots, pink at first but becoming violet-coloured, though hardly ever ecchymotic. After about a week the spots begin to get paler, those on the lower extremities being the last to disappear. As the spots pale the temperature gradually falls. In nearly all cases a little black scar is found at some spot on the body; and the observers think that this may mark the site of inoculation with the disease. Constitutional symptoms are not severe, and albuminuria is absent, but the liver is enlarged, and occasionally there is some congestion at the bases of the lungs. Nerve symptoms are common, and resemble those seen in meningitis. So far the only fatal case has been in a patient, aged 15 years, who had some previous myocarditis. Drs. Boinet and Pieri seem to be doubtful whether the epidemic is really one of Brill's disease, but Dr. Netter, in the discussion following the communication, regarded the diseases as identical, though he admitted that the fever and eruption formed part of the usual symptoms of dengue fever.

THE DECLINE IN LEAD POISONING.

THAT lead poisoning has been declining in this country during the last thirty years is common knowledge among the medical profession. This statement, however, rests rather upon individual than collective experience. Dr. Frederick L. Hoffmann, consulting statistician, Prudential Assurance Company, America, who has unusual opportunities of obtaining data upon a large scale, confirms the statement as regards his own country and ours. The information comes opportunely, and ought to be helpful to all who are interested in the social and economic problems of industrial plumbism. The decline in lead poisoning is the result of regulations introduced over thirty years ago. Within recent times an appeal for reforms has been made and a widespread call for prohibition heard, but in those countries wherein prohibition has been adopted there have been, we are informed, serious economic consequences, alike to the industry and the workers. The British Government, before resorting to prohibition, took the wiser course of insisting upon fresh regulations being tried, involving, particularly in the case of house-painters, wet instead of dry methods of cleaning old painted surfaces. In the United States the deaths from lead poisoning declined during the period 1910-24 from 2.5 per million to 1.4, and this in every section of the country investigated. In the U.S. navy the case rate declined from 0.5 per 1,000 in 1913 to 0.05 in 1924; in New York City it fell from 4.5 per million in 1904 to 1.1 per million in 1924. Hoffmann reminds us that death from plumbism occurs among many of the population who are not industrially brought into contact with the metal—for example, children who have sucked lead-painted toys, and women engaged in home work. In painters there were 407 deaths in the five years ending 1915, as against 360 during the five years ending 1923; the average age at death of painters meanwhile had risen from 50.6 years to 51.9 years during the same period. Taking the cases reported to the authorities, the average age at which illness developed was 36.3 years—a circumstance which shows that lead poisoning in a non-fatal form occurs comparatively early in a painter's life. In the United States the largest number of cases of plumbism occur among workers in electric storage battery plants. Of 920 cases in all trades, 50.1 per cent. were in men engaged in this industry, as against 29.3 per cent. in painters. The malady appears in electric storage battery workers early (33.2 years). In Germany the rate of chronic lead poisoning in these workers is 1 per cent., in Great Britain 3 per cent., and in the United States 18 per cent. The general decline of industrial plumbism in the United States is attributed by Hoffmann to the higher standard of living among the wage-earners, improved nutrition increasing their resistance and causing them to be less liable to fatigue. Possibly the difficulty of obtaining intoxicants may have a helpful influence, also the better ventilation of factories, periodical medical examination of the workers, and rational factory legislation. In the Utah mines lead poisoning occurred with considerable frequency when the men were working in the carbonate ores. Of 2,702 patients admitted into the Miners' Hospital for all causes, 8.3 per cent. were suffering from plumbism, but, taking the calculated rates per 1,000 men in the chief lead-producing regions of Utah, the numbers of cases were 62.7 for 1919, 34.7 for 1920, 21.7 for 1921, 17.7 for 1922, and 10.0 for 1923. As regards lead poisoning in potteries, Hoffmann remarks that in the light of his knowledge, extending over thirty years, of conditions in American potteries, the incidence of the disease has been reduced to such negligible proportions as to be, practically speaking, a thing of the past. The mortality rates of the United States and those of England and Wales are contrasted. In 1925 the chief inspector of factories reported 13 deaths in Great Britain from lead

poisoning, not including painters, as against 32 for 1924. The total number of cases of plumbism notified declined from 486 in 1924 to 326 in 1925. In the potteries, while the number of cases notified remained the same (47) for the two years mentioned, the deaths fell from 18 to 5. British statistics thus confirm American experience as to the marked decline of the hazard in industries in which lead is used. Hoffmann draws attention to the subject of "lead absorption" and "lead poisoning." The two are not one and the same. Dr. Kehoe examined 65 apparently healthy American workmen taken at random, and found lead in the urine or the faeces, or in both, but not one of the men was suffering from plumbism. At present there is no known quantitative expression of lead excretion in man which is significant of impending or present plumbism.

THE GENERAL MEDICAL COUNCIL.

THE winter session of the General Medical Council lasted only four days. It seemed likely that the business would extend into a fifth day or even longer, but the postponement of a penal case enabled the Council to complete its business in an unusually short session. Sir Norman Walker, at the close of the proceedings, said that the saving of a day would be very gratifying to the treasurer, for it meant that the Council would be in pocket by some £250. This figure gives some substance to the common assertion that, for the time it is sitting, the Council is an expensive judicial body. A little calculation shows that its proceedings cost one pound a minute; this is merely in fees and allowances to members, and does not take account of its continuing expenses nor of the expenses of those who appear before it. The disciplinary cases on this occasion, apart from those postponed for judgement from previous sessions, numbered only seven, and none of them raised any fresh points of professional interest. Five out of the seven were consequent upon court convictions for drunkenness or offences arising out of alleged drunkenness, and the other two cases were charges of adultery during professional relationship. The names of both the practitioners who had figured in Divorce Court proceedings were erased. The Council, of course, takes no cognizance of adultery as such, but only of professional relationship precedent to or contemporaneous with such adultery. Both these cases emphasized the fact that the Council does not regard itself as bound to proceed strictly along the lines followed in courts of law with regard to the admission of evidence. The legal representatives of the practitioners in both instances protested against being called upon to meet documents, such as letters, diaries, and prescriptions, put in at the last moment, after the sworn declarations regarding the complaint had been made. They contended that in a court of law such a proceeding would not be allowed, and that a defendant and those representing him should know beforehand exactly what he had to meet. The objections were, however, overruled. It is well, therefore, for all who may come before the General Medical Council to be aware that it does not regard itself as bound to observe the rules and precedents which obtain in ordinary courts of law. In none of the cases in which drunkenness was a feature did the Council proceed to the extremity of erasure, but in three of them judgement was postponed to a later session, when the practitioners in question will have to bring forward testimonials from their professional brethren as to their conduct in the interval. The non-disciplinary business of the Council occupied only a brief morning. It included the presentation of a final report by the Education Committee on the progress throughout the country towards the readjustment of the medical curriculum in accordance with the resolutions of the Council adopted in 1922. This report is a volume of nearly 200 pages, but its presentation led only to a short discussion, mostly inaudible in the press gallery. The acoustics of the Council chamber have lately been improved, but the press are unfortunately situated in a gallery, beneath which many of the speakers address the Council, unseen by the press, and often unheard. That the press may be useful to the General Medical Council was proved by the chairman of one of the committees, who, in presenting a report, begged the newspaper representatives to take special note of what he had to say. This is probably the first occasion that the "strangers in the gallery" have ever been addressed other than in the words, "You are requested to withdraw."

THE HUMAN FACTOR IN INDUSTRY.

THE EARL OF BALFOUR presided over an interesting meeting of the National Institute of Industrial Psychology on November 25th, when a number of the Institute's investigators described how psychology entered into the experience of the factory. Lord Balfour said that the industrialist chose the material elements in his organization with the greatest care, and with every regard to their adaptability to the end in view, but the machine so designed was put in charge of human beings with regard to whom no particular selection or study had been made. Even if the best-intentioned person were put in a position unsuited to his tastes and abilities he would be not only unhappy, but inefficient. In a subject such as industrial psychology the interests of employers and employed were obviously identical. He was inclined to believe that such interests were always in the long run identical, but there could be no doubt at all that in the field of psychology what was good for one was good for the other. The Industrial Fatigue Research Board, a branch of a much larger body, the Medical Research Council, was carrying on valuable work, but a Government department could not be expected to deal with the special details of a particular industry, and this was where the National Institute of Industrial Psychology became so useful. The Fatigue Research Board dealt with fundamental problems, while the Institute endeavoured to apply psychological science to the actual detailed necessities of particular firms or industries, and he noted that the present staff of the Institute had made special studies for forty-five firms covering twenty-six industries. Following Lord Balfour's speech, a number of inquirers who had been advising on factory plant gave brief accounts of their experiences and observations. One of them said that while an electric motor would work almost as well in an arctic as in a tropical environment, and had limits of output which could be defined with mathematical accuracy, and movements that proceeded with geometrical precision, human beings were of infinite variety, and the reactions of the same individual to different circumstances covered an almost unbelievably wide range. Another investigator said that his investigations had shown that individuals differed considerably in the extent to which they found a given task irksome on account of its monotony. Some preferred the monotonous tasks because these gave them the opportunity for day-dreaming. Generally, the higher the intelligence of the worker the more repugnant was the repetition task. The advice which the Institute had given in order to avoid monotony was to introduce rest pauses, to use music and singing where possible, to improve drab surroundings by attractive pictures and the like, and, most important of all, to adopt periodical changes of work.

DR. L. S. T. BURRELL, physician to the Brompton Hospital for Diseases of the Chest, has joined the Medical Advisory Committee of the Asthma Research Council.

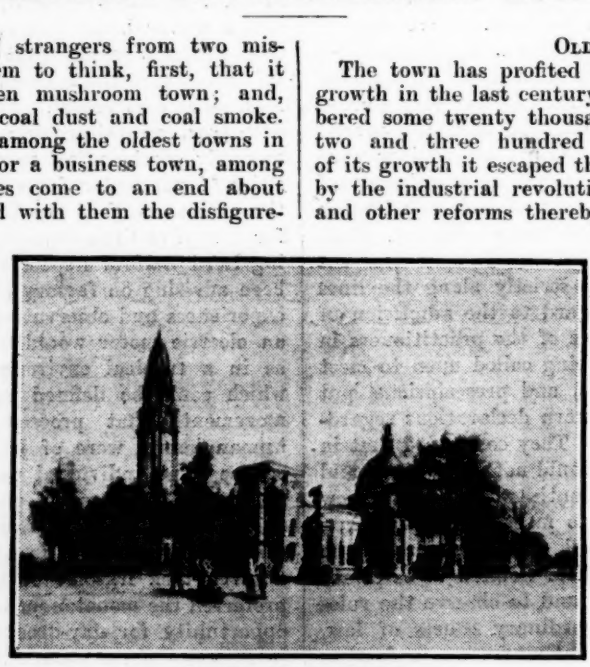
NINETY-SIXTH ANNUAL MEETING
of the
British Medical Association,
CARDIFF, 1928.

TOWER OF ST. JOHN'S CHURCH, CARDIFF.

THE ninety-sixth Annual Meeting of the British Medical Association will be held in Cardiff next summer under the presidency of Sir Ewen Maclean, M.D., F.R.C.P., Professor of Obstetrics and Gynaecology in the Welsh National School of Medicine, who will deliver his address to the Association on the evening of Tuesday, July 24th. The sectional meetings for scientific and clinical work will be held, as usual, on the three following days, the morning sessions being given up to discussions and the reading of papers, and the afternoons to demonstrations. The Annual Representative Meeting, for the transaction of medico-political business, will begin on the previous Friday, July 20th. The provisional programme for the work of the Scientific Sections is being drawn up by an Arrangements Committee, consisting partly of Cardiff representatives and partly of members appointed by the Council of the Association. The names of the Presidents of Sections are given in a Current Note published in this week's SUPPLEMENT; the full list of officers, together with other details of the arrangements for the Annual Meeting, will appear in later issues. On the last day of the meeting (Saturday, July 28th) there will be excursions to places of interest in the neighbourhood. The Association last met at Cardiff in 1885. We publish below the first of a series of historical and descriptive articles on the city and its medical institutions, written for the occasion by Dr. Donald R. Paterson.

CARDIFF: AN INTRODUCTORY NOTE.

CARDIFF suffers in the mind of strangers from two misconceptions. They generally seem to think, first, that it is an entirely modern and even mushroom town; and, secondly, that it is black with coal dust and coal smoke. As a matter of fact, Cardiff is among the oldest towns in the country, and, at all events for a business town, among the cleanest. The coal measures come to an end about five miles north of the city, and with them the disfigurement of town and country that seem inseparable from industrialism. Cardiff, situated on an alluvial plain, ringed with hills, on the shore of the Bristol Channel under the lee of Penarth headland, is singularly free from coal smoke and coal dust. The coal tips, and with them the coal dust, are away at the docks, which are separated (like Athens from the Piraeus) from the shopping and residential part of the town by a long and, it must be confessed, an unlovely street, only made interesting by its extremely polyglot shop names and signs. Further, Cardiff does not consume much coal for industrial purposes, and the clear atmosphere which it enjoys permits the Portland stone of its public buildings to weather to a silveriness not often seen.



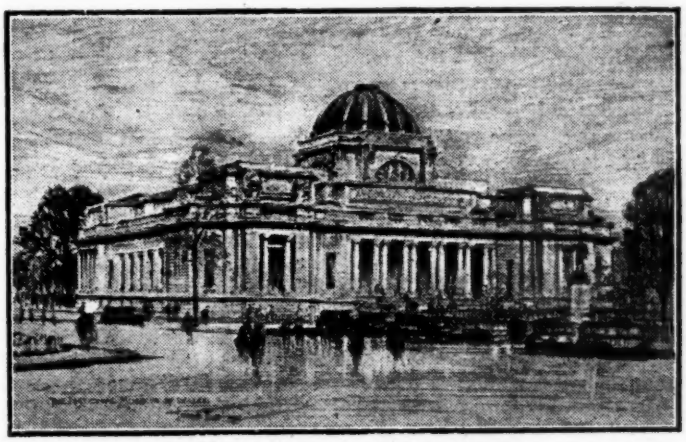
THE CITY HALL, CARDIFF.

There are few prettier approaches to the centre of a big town than the approach to Cardiff from the west over the river Taff, flowing between public gardens on one bank and Lord Bute's castle and grounds on the other, from its hills to the north; and to the south flowing past the recreation ground, with Penarth headland to close the view.

OLD AND NEW.

The town has profited both by its antiquity and by its growth in the last century. (A hundred years ago it numbered some twenty thousand souls where now are between two and three hundred thousand.) By the modernness of its growth it escaped the evils so dangerously aggravated by the industrial revolution, and profited by the sanitary and other reforms thereby forced on the community, and the Minister of Health was able to say only the other day that Cardiff has no real slums. It has plenty of open spaces, and has planted its thoroughfares with trees. It has Roath Park with its lake to the east, and to the west Victoria Park and the Llandaff Fields leading to the Cathedral. More fortunate still, perhaps, it was able to purchase from Lord Bute Cathays Park, right in the centre of the town, and there to group its public buildings. It is the possession of these buildings, surrounded by parks and gardens, that is now perhaps the chief glory of Cardiff. They increasingly attract the attention of all interested in the application of architecture to civic needs. In its rapid modern rise the city had several times outgrown its buildings, and when the time came to embark on a further venture it was fortunate in being able to acquire a park with a fine avenue of trees near the Castle, to be devoted solely to public needs, and in having an enlightened civic authority who not only commissioned first-rate architects to design the principal buildings, but laid down conditions which established the uniformity, harmony, and proportion of the buildings on the site which

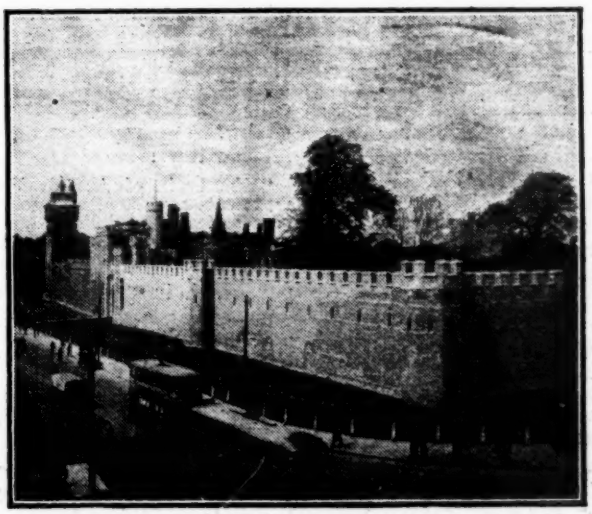
formed such a striking feature of the whole. The buildings already erected in Cathays Park are the City Hall and the Law Courts, the National Museum of Wales, the Glamorgan County Hall, the Technical College, and the University Offices and University College, with "an effect," in the words of a high authority, "almost incredibly successful." The frontage to the south with the City Hall occupying the middle, its tall clock tower a magnificent landmark, flanked on the west by the Law Courts on more severe lines, and on the east by the National Museum, justly termed a masterpiece, is an achievement unique in modern municipal architectural design.



NATIONAL MUSEUM OF WALES, CARDIFF.

But besides these advantages of its modern growth, it has the interest and evidence of antiquity. Here the Roman established a fort and kept sea communication open with the hinterland, and in mediaeval times the Norman made the town the *caput* or head of his marcher-lordship and fostered its trade. Those eras have bequeathed to Cardiff its Castle right in the centre of the town, now the residence of the Marquis of Bute. The Castle presents in stone an epitome of the history of the town. Retaining the rectangular form which stamps its Roman origin, the reconstructed massive walls combine to show parts of the Roman wall *in situ*, as well as Norman work. Within the *enceinte* may be seen the north gate of the Roman period, and the great Norman castle-mound crowned by a ruined stone keep of the thirteenth century. The Castle Lodging, or present residence on the west side, embodies the fifteenth century and later work enriched with notable additions by the late Marquis and his architect, Burgess.

Hard by, standing in the heart of the old town, is the one survival of Cardiff's old churches, the Church of St. John the Baptist. Its beautiful tower with a rich coronal of the Somerset Perpendicular type erected in the fifteenth century is a notable landmark. The mother church of Cardiff—old St. Mary's—a cruciform structure of the twelfth century which stood on the bank of the Taff, was undermined by the river and destroyed. Foundations of churches of the Grey Friars and of the Black Friars have been preserved; on the site of the former near Cathays Park a fragment of a sixteenth century house built out of its remains is still to be seen.



CARDIFF CASTLE.

By enlargement of its boundaries Cardiff has recently included the picturesque village-city of Llandaff and its ancient Cathedral, the reputed shrine of St. Dyfrig and St. Teilo. A structure embodying work of various periods from the twelfth century down, the Cathedral, with its fine early English west front, had long remained roofless, till its skilful restoration half a century ago. The interior decoration is of interest from its association with pre-Raphaelite artists. There are four glass windows by William Morris, and the paintings of the panels of the reredos are by Dante Gabriel Rossetti. On the high ground above the Cathedral there is the recently uncovered ruin of a bell tower—an example of the detached campanile—and the ruins of the old Bishop's Palace, now forming a gateway to the Palace grounds. Amongst the modern churches there is interesting work of Bodley in the churches of St. German's and St. Saviour's, and in addition to the modern secular buildings in Cathays Park should be mentioned the new buildings of the Welsh National School of Medicine—the munificent gift of Sir W. J. Thomas, Bt.

EDUCATION, GENERAL AND MEDICAL.

In the matter of education Cardiff has made notable progress. Its primary and secondary schools are almost all modern buildings, airy, commodious, and equipped with school libraries. A recent addition is an open-air school for ailing children. The University College, founded in 1883, after living for a time in wooden sheds is now nobly housed. Most faculties are represented in it. Its medical side has lately been developed into a complete school, though the form of its administration has not been finally settled. Technical education has made great strides and the work of its college has undergone rapid extension.

The development of the educational side of the National Museum is a movement in which Cardiff may justly claim to be in the van. The admirably arranged collections in buildings at once elevating and refined are increasingly taken advantage of by children of school age, with the best results. The Cardiff Public Library, with its fine collection of Welsh manuscripts and printed books, and documents and prints of specially Welsh and Celtic interest, is more like a national than a municipal institution.

The medical activities of the city are mainly centred in the Royal Infirmary. It comprises, on what is now a somewhat crowded site, all departments. It is the clinical side of the Welsh National Medical School, and a notable recent addition to it are the fine clinical laboratories of the medical unit erected by the Rockefeller Foundation. At the docks the Royal Hamadryad Seamen's Hospital, a modern building which replaced the *Hamadryad* ship, looks after the needs of the shipping population. There is a large Poor Law hospital with special departments. The City Mental Hospital is a well equipped institution which has established a wide reputation by its scientific work in psychiatry.

COMMERCE AND SPORT.

To turn to the commercial life of the city, there can be no need to say anything more of the coal industry. Cardiff is the acknowledged coal capital of the world, and its system of docks and industrial appliances is in keeping with its position. Its shipping and ship-repairing industry, with its dry docks, are on a comparable scale. The port is probably first in ownership of vessels engaged in the open carrying trade of the world, and none suffered more heavily through losses by enemy action in the great war. Cardiff has, too, its great milling industry and timber trade. In Cardiff the exchanges, Government offices, and headquarters of the firms engaged in these industries are at the docks, away from, and

not in, the centre of the town, as in places where big trade developed earlier.

Cardiff has always been keen on sport. Its Rugby football club in the palmy days was one of the foremost teams in the country. It was the pioneer of the four three-quarters line, and did much to develop the passing game. Its centrally situated ground, in the Cardiff Arms Park on the left bank of the Taff, has been the scene of many memorable contests. Part of the ground is reserved for cricket, where many of the county matches—Glamorgan is a first-class county—are played. The Association football team, though of recent formation, has rapidly come to the front, and is at present holder of the English Cup. Golf clubs around and in the neighbourhood of the city are increasing, and include some links of quite front rank further down the coast.

CARDIFF'S SETTING.

Cardiff is fortunate in its situation. The city is spread out within an amphitheatre open to the Bristol Channel, with scenery of no little variety.

On the east, along the estuary of the Severn, the shore line from the mouth of the Wye to Cardiff is low-lying, and the adjoining district, exposed in places to flooding by the tides, is protected by a sea wall whose history goes back to Roman times. From the Penarth headland to the west the coastline changes to vertical cliffs of lias limestone, which are ever undergoing change. About five miles from Cardiff, where the older carboniferous limestone has resisted the action of the sea, it forms an island at high tide, and between it and the mainland the large and important docks of Barry have been constructed. From there to the mouth of the Ogmore is the shore line of the Vale of Glamorgan, in reality an undulating plateau scored by pleasant little valleys, well wooded, with sheltered villages, many of which contain picturesque remains of a mediaeval castle. This district, devoted to agriculture, and having in former days "much corn and grass," abounds in evidence of early settlement, and has not a few interesting old churches.

North of Cardiff the ground rises gradually to the foothills which form the southern edge of the great coal-field. Five miles from Cardiff the ridge is breached by the gorge of the Taff, the only natural outlet of the coal-field behind. It was this natural outlet that gave Cardiff its importance a hundred years ago, when the demand for steam coal led to the development of the mineral wealth of South Wales. Through this outlet the Taff, flowing through the well wooded slopes of the gorge, with the reconstructed fortress of Castell Coch sentinel-like on its eastern shoulder, forms a picture of great charm, and, while it boasted the late Lord Bute's vineyard, suggested a miniature Rhine.

Beyond, the scene is more sombre. The district drained by the upper reaches of the Taff and by its tributaries is the famous steam coal area, upon which depend the existence and prosperity of the city. Its deeply entrenched valleys, at the bottom of which pits have been sunk and a dense urban population has settled, give to the Welsh coal-field a character all its own and explain many of its problems. Above the valleys, bleak and bare hills clothed with rough grass lend interest and variety to the scenery. Their lower flanks, once thickly wooded, still reveal here and there traces of a sylvan beauty that vanished before the needs of an industrial age.

Moreover, Cardiff is particularly well situated for excursions in beautiful neighbourhoods. A glance at the map will show that, with London and Birmingham, the neighbourhood of Cardiff is one of the districts most thickly threaded with railway lines. By these and other means the valley of the Wye and Usk and the beautiful scenery of Monmouthshire and Brecon are easily accessible, and an active service of cross-channel steamers brings North Somerset and Devon and the Exmoor country within the scope of a day's excursion.

One final word. In spite of its modern industrialism, Cardiff has its link, not only with antiquity, but with romance. Few even of its own citizens seem to remember that it was from Cardiff, according to the *Morte d'Arthur*, that Lancelot took ship when he fled from the Arthur whose honour he had betrayed, and from Cardiff also that Arthur took ship to follow him. It was in what represented Cardiff Castle in Arthur's day that Tennyson's Sparrowhawk had his stronghold, and Enid was a Cardiff girl. But, of course, it was to the citizens of an entirely legendary Cardiff that Tennyson's Geraint said:

> "Ye think the rustic cackle of your bourg
> The murmur of the world!"

THE BRAIN OF ANATOLE FRANCE.

BY

SIR ARTHUR KEITH, M.D., F.R.S.

ON November 12th, 1924, Anatole France died when halfway through his 81st year. For half a century he had attracted, charmed, irritated, and instructed a vast army of readers recruited from the more intelligent classes of all civilized countries.

Two days after his death his brain, the source of so many deathless pictures, was on its way to the Medical College of Tours, there to undergo detailed examination by anatomists, in the hope that modern skill might detect in its structure some definite basis which would explain the genius of the novelist. The search was conducted by the professor of anatomy, Professor Guillaume-Louis, and his chief assistant, Dr. Dubréuil-Chambardel.

After an interval of three years the anatomists have at last drawn up their report; it was read at a meeting of the Academy of Medicine held in Paris last month.[1] From this report we learn that the brain of Anatole France, when stripped of its membranes, weighed only 1,017 grams, some 340 grams—about 25 per cent.—less than we expect to find in a man of mediocre ability; that the two cerebral hemispheres, of exactly similar weight, turned the scales at 854 grams—28 per cent. below mediocrity. We are told that the fissures and sulci which separated the relatively simple lobes and convolutions of the brain were deep, that the ventricles of the brain were small, and that therefore, in relation to mass, there was an extensive development of cortical grey matter.

No drawing, photograph, or illustration is reproduced to assist the reader in following the dry, descriptive details of the anatomical narrative, but from what we are told and from what can be inferred we must come to the conclusion that there was nothing in the external conformation of the brain of Anatole France which would lead an expert anatomist to infer that it had been the seat of genius. The reporters sum up the results of their examination thus:

> "The brain of Anatole France is of an admirable form. It represents a piece of real goldsmith's work, the convolutions being long and sharply delimited, well folded, pressed tightly together, showing a very unusual degree of complexity."

To do them justice one must reproduce their final paragraph in their own tongue:

> Pièce d'orfèvrerie, avons-nous dit, ce cerveau était comparable pour la qualité a ces délicieuse petites pendules sorties sous Louis XV des ateliers de Julien Leroy, l'horloger toûrangeau, et qui, élégantes et légères, sous l'ornement d'un travail de ciselure inégalable, portaient un mécanisme d'une precision parfaite.

The reporters may be justified in comparing Anatole France's brain to one of Julien Leroy's wonderful little clocks, but, before we accept their simile as a possible explanation of the special faculties of Anatole France's brain, let us think for a moment of what we have a right to expect from them. Suppose it was not a brain, but one of these precious little clocks we had asked them to report on. What should we think when, having read their account of its external dimensions, the lettering on the dial, and the exquisite chasing of the frame, we find that they have nothing to say of its internal works—that they have not even glanced at them? That is exactly how they have treated Anatole France's brain; they have not sought to determine the extent of any one of the score or more of the cortical areas, they have not examined the detailed structure of any one of these areas; the vast masses of grey matter in the basal region of the brain, which must have so much to do with the emotional side of a man's mentality,

[1] *Bull. de l'Acad. de Méd.* 1927. Vol. 98, pp. 328-336 (November 8th, 1927.)

are altogether overlooked. My French colleagues may well ask me if I know what an examination of this kind entails—that it means a mastery of the finest neurological technique, a collection of all that is now known concerning the microscopic architecture of the human brain, and three years of hard labour. Yes! I know all these conditions are requisite, and, unless they are complied with, such a precious opportunity as this has been wasted and their perfunctory labours thrown away.

It is true that there are now many metaphysicians and not a few psychologists who regard the brain as merely a living spongework in which the mind or soul rests, and who will be prepared to receive the published account of Anatole France's brain as amply sufficient for all practical purposes. Medical men—anatomists, physiologists, and clinicians—have reason to think differently. Experiments made by design, by disease, or by accident have assured them that the brain is a highly organized complex functional structure, and that we yet can hope to discover the exact role played by every collection of its nerve cells and every tract of its nerve fibres, and that ultimately the anatomist will be able to assess the potential value of any given brain. It is true that this time has not come, but we have every reason to believe it will come.

Although we know nothing of the finer structural organization of Anatole France's brain, we do know that with it he was performing feats of genius while millions of his fellow countrymen, with brains 25 per cent. or even 50 per cent. larger, were manifesting the average abilities of daily labourers.

Such an instance may well make our critics sceptical of any direct relationship between mass of brain and manifestations of mental ability. And yet all our speculations regarding man's evolution are based on a close relationship between mass of brain and its capacity to serve man's needs. As we trace the rise of the brain, from the lowest to the highest of living primates, we see that the nearer that any given brain approaches to that of man in mass and in conformation, the nearer does its owner approach to the mentality of man. With the evolution of vertebrate animals we see that mass of brain and complexity of mental reaction have gone hand-in-hand, but there are notable exceptions: whales and elephants have the most massive of brains, and manifest no corresponding increase of ability which can be called mental in any sense. To this old problem I added my little quota thirty-three years ago.[1] If we weigh the brains of dogs of graded sizes we find that with each increase in body mass there is an increment in weight of brain, this increment decreasing, the heavier the dog. Somehow each additional area of skin and mass of muscle entails an addition to the make-up of the cerebrum, and such additions are not concerned in the manifestation of intelligence. But as Anatole France was a man of average size we cannot ascribe the smallness of his brain to a lack of the "corporeal concomitant" element, though the existence of such an element, whatever its fundamental and structural nature may prove to be, does explain the massive brain of the whale and of the elephant.

This lack of correspondence between brain mass and mental ability, as measured by accepted standards, has been a lifelong puzzle to me. I have known, in my student days, men with the most massive heads and sagacious appearances who proved failures in all the trials to which the world submitted them, and I have known small-headed men succeed brilliantly, just as Anatole France did. What is the solution? Do the conditions of life bring out in a measurable form all the inherent qualities of man's brain? Can we measure them by any system of psychological tests yet devised? Is there not such a quality as depth of feeling which need have no value in any kind of market in the world of commerce, science, art, or literature? What part of the brain is it that makes a man or woman so intensely affected by music, by art, by suffering, or any emotional disturbance whatsoever?

The human brain, one may well believe, is an organ that has come to us not only to give the power to understand, to judge, to remember, to regulate conduct, but also as a purely sensory organ to make us enjoy life and cling to it. The tests we apply for genius are not those which measure all the powers of which the brain is capable. Many of them are inarticulate or silent. Anatole France, above all, was an anatomist of human nature who sought, as is the habit of primitive minds, for clear and concrete expression. To be an artistic exponent of the wiles of human nature may mean a peculiar ability, but this exceptional power is one we need not be surprised to find associated with a small brain. Such a brain may have limited powers in other directions.

A detailed study of Anatole France's life, so far as it is known, shows us that he was in many senses a primitive man. In the long run I expect it will be found that there is a close correspondence between brain mass and the degree of function subserved by that organ.

[1] *Journ. of Anat. and Physiol.*, 1894, vol. 29, p. 282.

France.

[FROM OUR SPECIAL CORRESPONDENT.]

SOCIAL ASSURANCE.

THE great question of the day which is occupying the thoughts of all members of the medical profession is the law of medical assurance. It has been passed by the Senate, and there is no sort of doubt that it will be passed by the second chamber also. It is fairly certain that it will modify profoundly the conditions of medical practice in France. The matter, serious enough in itself, turns to tragedy when it is realized that the practitioners of medicine have failed to recognize the need for presenting a united front to defend the interests of the French sick. In the last resort theirs was the only interest at stake. Many of us think that the law will turn the doctors of France into "functionaries," and are distrustful of anything like a State organization. It may, indeed, be said that the general body of the medical profession as represented by its syndicates is distinctly opposed to the way in which the social assurances law is to be worked. Unfortunately the syndicates have not found a common ground for action, and the ditch digged between the Union Nationale and the Fédération Nationale still yawns. The great efforts that are being made by the wiser heads render it possible to hope that unity may yet be achieved. If they succeed it will be possible to launch this much-talked-of law in a floatable condition; if they fail we seem to be in for a great disillusionment.

CONGRESSES.

The session has begun, as is customary, with a series of congresses which have been particularly well attended by our foreign confreres. We have had the two national congresses of medicine and of surgery in Paris, and each has had its satellite congresses of the several specialties. Reference must be made in particular to the International Congress of Hydrology at Lyons. British medicine was very well represented at it, and it seems to have marked a turning point in the story of this department of practice which has been called natural therapeutics, and is as greatly admired by some as it is despised by others. Never before have its problems been attacked with so much scientific precision; the clinicians refused to be outdone by the chemists, the geologists, or the physicists, who attended in large numbers. Doctors of the old school seemed, indeed, to be a little perturbed to see the field of simple observation invaded from every direction by the laboratory. The members of the International Society of Medical Hydrology, which was cradled in London, invited the "hydrologues" to meet them in Rome, and the occasion afforded opportunity for one more fine international manifestation. This friendship, which overpasses frontiers, will help to console our war generation, and gives us good hope for the future.

LE FOYER MÉDICAL.

Thanks to a very happy initiative, we shall be able henceforth to offer the foreign medical man staying in Paris a welcome he will particularly appreciate, because it will afford him the privileges and comforts of a professional club. What we have established is not a scientific institution, but a social centre where information of all sorts is

made available, and where members will find a rest room, a writing room, and a restaurant. Admission is by introduction, but the formalities will be made as simple as possible, the committee desiring only to be assured of the *bona fides* of the candidate. An introduction from one of the officers of the British Medical Association would, for instance, suffice; perhaps the best course for any member of the British profession wishing to join the Foyer would be to communicate with the Medical Secretary of the British Medical Association. Foreign members pay an annual subscription of 100 francs. The Foyer Médical has its rooms at 10, Avenue d'Iena, near the Trocadero. We greatly hope that our foreign confreres will take full advantage of an organization which we are a little bit ashamed of not having started before.

LA CITÉ UNIVERSITAIRE.

On the other hand, it is quite in the south of the capital, in a quarter unknown to tourists, that the Cité Universitaire has been erected. It consists of a series of colleges for French and foreign students, and its foundation is due to the splendid generosity of a true philanthropist, M. Deutsch de la Meurthe. His example was soon followed by others, both at home and abroad. The movement is as yet only in its early stage; it will grow quickly. Let it be noted that the idea it embodies is not new, for in the Middle Ages every province of France and almost every foreign nation maintained its students' hostel in Paris. Now we have these old institutions under a new form. The British foundation takes the lead with three hundred bedrooms; the American comes next with two hundred and fifty. Altogether the foreign foundations will provide accommodation for eleven hundred students, or about a third of all those from other countries now attending the University. A particularly warm welcome awaits medical students, who will find many opportunities of rubbing shoulders with comrades of French and other nationality in the libraries, the recreation rooms, and the sports grounds of the Cité Universitaire.

NEW INSTITUTE OF PHYSIOLOGY.

Our Paris Faculty is indebted to an anonymous donor for a new Institute of Physiology which has just been opened. The site had been bought by the State and given to the École de Médecine a long time ago, but money to meet the cost of building and equipment was lacking. Now the laboratories are up and at work. Other institutes are to follow, notably an Institute of Hygiene. It is very cheering to find that at a time when the State has to economize on the budget, public opinion has awakened to the necessity of putting our men of science in a position to pursue their researches. Year by year we feel the intellectual heart of after-war France beating more strongly.

G. MONOD.

New Zealand.

[FROM OUR CORRESPONDENT.]

HOSPITAL REFORM.

THE final report of Dr. M. T. MacEachern, associate director, American College of Surgeons, on the hospital system of New Zealand, has just been received by the New Zealand Branch of the British Medical Association, the Department of Health, and the Hospital Boards' Association. Dr. MacEachern was invited by the Victorian Government to report on the hospital system of that State, and advantage was taken of his presence in this part of the world to ask him to report on the New Zealand hospital system. He spent a month inspecting the New Zealand hospitals and inquiring into the existing hospital system. Before leaving New Zealand he furnished a preliminary report, which was published, and was the subject of a conference of representatives of the Health Department, the British Medical Association, and the Hospital Boards' Association. Dr. MacEachern stated at that conference that he would furnish a more detailed report after his return to America, and this promise he has now fulfilled.

The report, which is a most voluminous one, is, of course, mainly on the lines of his preliminary report, but a number of additional suggestions are made for the consideration of the New Zealand hospital authorities. His main recommendations are:

(1) That there should be a Dominion hospital board comprised of representatives of the Health Department, the British Medical Association, and the hospital boards, to determine and co-ordinate the main features of hospital policy.
(2) The redistribution of hospital districts, with reduction in number.
(3) The addition of pay-wards in general hospitals to provide accommodation for all sections of the community.
(4) A wider adoption of the principle of honorary medical staffs for public hospitals.
(5) Abolition of the present system of the superintendent in many hospitals carrying on dual vocations—administrative and clinical—and giving full time to the former only.
(6) The promotion of more voluntary effort and community spirit in connexion with the Dominion hospitals.

In accordance with the arrangement made just before Dr. MacEachern's departure, it is intended to hold a conference of representatives of the Health Department, the British Medical Association, and the Hospital Boards' Association to consider the recommendations in the report.

NEW HOME FOR NEW ZEALAND BRANCH.

The New Zealand Branch of the British Medical Association has now come into line with the other Overseas Branches by the purchase of suitable premises for offices and library and as a meeting-place. The premises purchased are at 26, The Terrace, Wellington, close to the Houses of Parliament and the General Post Office. The building is an old one but of sound material and needed no extensive alterations, but it is the intention of the Association to rebuild in the course of a few years. No more suitable site could have been found, and land values in the vicinity are rapidly and steadily increasing. The secretary carries on an agency for the purchase and sale of practices, and it is hoped soon to house under the same roof the New Zealand Medical Assurance Society, which is apart from the control of, but approved by, the New Zealand Branch of the British Medical Association. The purchase of this property for the home of the Branch has been a determining factor in the formation of the New Zealand Branch of the British Medical Association into an incorporated society on the plan of the incorporation of the New South Wales Branch. The secretary of the New South Wales Branch advises that legal incorporation has many advantages and no material disadvantages. The New Zealand Branch is very strong, for in its membership are about 95 per cent. of the medical practitioners in New Zealand in active practice. With a habitation and abiding place it is confidently expected that the affairs of the Branch will continue to prosper even more than in the past.

Union of South Africa.

[FROM OUR CORRESPONDENT IN PRETORIA.]

TYPHOID IMMUNIZATION BY THE MOUTH.

BESREDKA, in 1919, maintained that typhoid and dysentery immunity was a property of the intestinal mucosa, any immunity substances such as agglutinins present in the blood being merely accidental overflow products. If anti-typhoid vaccination is entirely due to the action of the vaccine on the intestinal mucosa the subcutaneous route is a very roundabout one. Besredka, therefore, recommended the oral route. Vaillant, in 1922, published the strikingly successful results of this method in dealing with an epidemic of typhoid in the North of France. Following on these workers, Pirie and Orenstein dealt, with apparent success, with three epidemics occurring amongst natives on Witwatersrand gold mines during November, 1922, April, 1923, and September, 1923. The results showed that the administration by the mouth was at least as efficacious as the hypodermic method. Since then other local observers have reported favourably on its use; this favourable evidence points to the possibility of so simple and economical a method being used for general vaccination of those portions of the community where the incidence of typhoid continues to be very high. The advantages of this method of administration, particularly when dealing with large bodies of natives, are considerable. Natives most

strongly object to having needles stuck in them, and it is found that they do all they can to evade the injection of the pneumococcal vaccine which all the natives on the gold mines receive. They raise no objection, however, to taking any amount of medicine by the mouth. The oral method is followed by no unpleasant reaction; in none of the thousands of natives that have been orally vaccinated has any malaise occurred.

The list of bacterial vaccines prepared in the routine division of the South African Institute for Medical Research now includes material for oral typhoid immunization. The vaccine consists of a suspension of killed *B. typhosus*, *B. paratyphosus* A, and *B. paratyphosus* B. In the trials made on the mines the method of using a pill of killed bacilli as prepared by Besredka was relinquished in favour of the fluid form. An ox-bile pill is administered simultaneously to prepare the intestinal mucosa for the action of the vaccine. The local method is to give one of the pills with a teaspoonful of the vaccine on each of three successive mornings. Prepared in large quantities the cost only amounts to 2d. a dose—that is, 6d. for the whole process of immunization—including the bile pills. With so small a cost general immunization becomes economically sound. Some hundreds of workers can be immunized at the cost of treating, compensating, etc., one patient who contracts typhoid.

Tissue Culture in Vitro.

Dr. M. J. A. des Ligneris, until recently in charge of Elim Hospital in Zoutpansberg and district surgeon of that region, is the present holder of the Arnold Friedlander Fellowship of £600 a year, and is now engaged on a series of studies on cell growth *in vitro*, at the South African Institute for Medical Research. No similar experiments having previously been undertaken in this country, the experience of other workers is only available in the form of literature. A simple medium was decided on, and, notwithstanding Carrel's finding that serum inhibits growth, a serum medium is being successfully employed, after other media such as agar and gelatin in various combinations and in various forms of culture vessels had been tried. Growth is found to occur in both auto-serum and in serum from an homologous animal; but heterologous serum is usually found to be growth-inhibiting. Pure serum is found not to give the best results, the most abundant growth being obtained by mixing the serum with diluted tyrode solution. Various animal tissues are used, such as those of the rat, guinea-pig, rabbit, and occasionally man. The tissues cultivated include all the main mammalian organs—brain, lung, heart, liver, spleen, kidney, thymus, salivary gland, voluntary muscle, ovary, testis. As the work is being done in a laboratory in which other work is carried on with much mov ent of persons, and also because of the not infrequent dust s rms of Johannesburg, it was decided to use a glass box, as recor mended by Strangeways. The box is open at the two ends, so that access of streptococci and other organisms is to some extent prevented. The work has reached a stage where report is possible, and Dr. des Ligneris's paper is awaited with interest.

England and Wales.

Hospital for Crippled Children in Devon.

The Duchess of York opened a hospital for crippled children at Buckerel Bore, on the outskirts of Exeter, on November 16th. The main building is about 200 feet long and provides accommodation for forty patients in one large bungalow ward, with a southern aspect; in front of it is a terrace of ample depth for two rows of beds. Separate dressing rooms and isolation wards are placed at each end of the ward, and behind it there are rooms for light treatment and clinical examination. A corridor leads to the operating theatre block, which was erected and equipped at a cost of £2,500 by the Exeter Rotary Club. Another corridor connects with a private residence which has been converted for the work of administration. An isolation block is in course of erection, and provision has been made in the plans for the addition of an adult ward should occasion arise. The total estimated cost of the hospital is £25,000, of which over £20,000 has already been received. Dame Georgiana Buller, daughter of the late General Sir Redvers Buller, was very largely responsible for the initiation of this institution, which with its associated clinics for out-patients in different parts of the county will represent the central portion of the scheme of the Devonian Association, which is concerned with all aspects of the cripple problem. Seven of these clinics are already in operation at Exeter, Okehampton, Honiton, Tiverton, Torrington, Barnstaple, and Torquay. The Duke of York, who accompanied the Duchess, paid a special tribute to the devoted work of Sir Robert Jones in connexion with the building and equipping of this hospital.

Maternity and Child Welfare Centre at Bow.

The Mayor of Poplar opened, on November 8th, a new maternity and child welfare centre in Bow, containing observation accommodation for ten children in two five-cot wards, and also an isolation ward. Well equipped dental and artificial light departments are also provided, and a small detached laundry. The cost of the building was rather over £12,000. The Ministry of Health has contributed half this cost and will also provide half the expense of upkeep. In the observation wards it will be possible to watch and treat premature, malnourished, and ailing infants. A laboratory for the provision of special milk modifications forms part of the institution.

University of London Medical Graduates' Society.

At a dinner of medical graduates of the University of London, held at the Langham Hotel on November 25th, it was decided to form a Society of Medical Graduates of the University of London, similar to the societies of medical graduates of the older universities. Sir StClair Thomson presided, and the formation of the society was proposed by Sir John Rose Bradford, President of the Royal College of Physicians of London, and seconded by Sir Cuthbert Wallace, Dean of the Faculty of Medicine of the University, who said that the objects of the society would be social and economic, with the hope of bringing the medical graduates of the University in closer touch, and particularly to link up those graduates who are resident overseas with their brethren at home. All politics will be excluded. There are now some 4,500 medical graduates of the University, and a society to hold them together should be a great success. On the proposition of Mr. W. McAdam Eccles, seconded by Lady Barrett, a committee was formed to formulate a constitution to be submitted to a general meeting of the society early in 1928. Mr. McAdam Eccles was elected acting honorary treasurer. The acting honorary secretaries chosen were Dr. C. A. H. Franklin and Dr. Dorothy Hare. Any medical graduates can join the ociety by writing to the honorary secretaries, at 124, Harley Street, W.1.

Scotland.

The Chemistry of Thyroxine.

At the opening meeting for the session of the Pharmaceutical Society of Great Britain in Edinburgh on November 18th, when Mr. Harvey P. Arthur of Glasgow was in the chair, the inaugural address was delivered by Dr. George Barger, F.R.S., professor of medical chemistry in the University of Edinburgh. The lecturer dealt with the chemistry of thyroxine and other hormones. The glands of internal secretion, he said, were now known to play a very important part in activating various organs of the body and in development and nutrition. The active principle of the secretion of several had been isolated, but only two, adrenaline and thyroxine, had been synthetically prepared in the laboratory. Adrenaline, secreted by the suprarenal glands, acted mainly as a constrictor of blood vessels, and thyroxine, secreted by the thyroid gland, had an important function in body metabolism. Young animals fed on thyroxine developed much more quickly, although they might finally be smaller than control animals. Even the pineal gland had been shown recently to possess an

internal secretion which in some respects was the counterpart of pituitary secretion. The lecturer explained in detail the work which had been done by Harington and himself in the synthesis of thyroxine, and, in particular, referred to the difficulty which had been experienced in the introduction of the four important iodine atoms in the molecule of thyroxine. An important key to the successful production of this substance had been obtained from the knowledge of a simpler iodine substance which apparently discharged in sponges, corals, and other lowly organized animals similar functions to those effected by thyroxine in the higher animals. Reference was also made to other important hormones, such as insulin, which, it had been stated, had been obtained by Abel in a crystalline form. It was not yet, however, certain whether the crystals obtained by Abel were insulin itself or an inert substance on which the hormone was adsorbed. The physiological action of various hormones and their chemical constitution were illustrated by lantern slides.

VITAL STATISTICS.

The more outstanding features of the vital statistics of Scotland during the third quarter of the year 1927 are a birth rate of 19.0 per 1,000, a marriage rate of 7.4, and a death rate of 11.1. The infantile mortality rate for the quarter was 67 per 1,000 registered deaths. The death rates from all forms of tuberculosis and from tuberculosis of the respiratory system were 91 and 64 per 100,000 respectively, both slightly higher than in the third quarter of last year. The actual deaths registered during the quarter numbered 13,639. In the larger burghs, taken individually, the quarterly death rate ranged from 14.7 in Dundee, 11.9 in Glasgow and in Edinburgh, 11.6 in Perth, and 11.4 in Aberdeen, to 8.7 in Dunfermline, 9.5 in Clydebank, and 9.7 in Motherwell and Wishaw and in Kirkcaldy; and the infantile mortality rate varied from 107 in Dundee, 87 in Ayr, 86 in Aberdeen, 83 in Greenock, and 82 in Glasgow, to 38 in Dunfermline and in Perth, 42 in Falkirk, and 45 in Motherwell and Wishaw; 652, or 4.8 per cent., of the total deaths were attributed to the principal epidemic diseases, this number representing 17 from enteric fever, 128 from measles, 41 from scarlet fever, 178 from whooping-cough, 86 from diphtheria, and 202 from diarrhoeal diseases among children under 2 years of age. Deaths from diseases and accidents of pregnancy and childbirth numbered 141, which is 6 fewer than in the previous quarter.

ABERDEEN UNIVERSITY RECTORIAL ELECTION.

The Earl of Birkenhead, the Unionist candidate, was elected rector of Aberdeen University on November 12th by the narrow majority of nine votes over his Liberal opponent, Sir Archibald Sinclair. Mr. John Masefield, who stood as an independent candidate, was more than a hundred votes behind either of the others.

HOSPITAL FOR CRIPPLED CHILDREN.

An appeal has just been issued in connexion with a scheme for a hospital for crippled children, with attached clinics, for the south-eastern area of Scotland. The scheme began with the appointment, at a conference in Edinburgh on March 16th, 1926, of a committee of investigation, which collected evidence from members of the medical profession and others possessing special knowledge. A second conference was held on February 25th, 1927, at which this committee recommended that a central hospital for the cure and care of crippled children should be built on the outskirts of Edinburgh, with major clinics to be formed in the more populous centres of the south-eastern counties of Scotland; that minor clinics should be established in the remoter parts of these counties, and that co-operation between the existing hospitals and the new central hospital was essential. The area to be covered by this scheme includes the counties of the Lothians, Peebles, Selkirk, Roxburgh, Berwick and the western half of Fife, Kinross, and Clackmannan. The general idea of the scheme is that the central hospital to be built in Edinburgh should contain 75 beds, for which a sum of £75,000 would be required. It is pointed out that after this capital fund has been provided the cost of maintaining necessitous children up to the age of 16 would be completely provided by parliamentary grants and local authorities.

CHINESE MEDICINE.

Dr. Clayton Grosvenor, in a lecture recently delivered in Edinburgh on medical work in China, said that the scientific pursuit of knowledge had practically stood still in China except where it was influenced by Western teaching. The whole of medicine was thus in the hands of the ignorant, the unscrupulous, and the quack, and medical practice was riddled with charms. Eight out of every ten children died before they were 2 years old. There was less than one mission hospital to every million people, and Western influence could therefore touch only the fringe of the suffering in China. It had long been seen that the proper way of dealing with the problem was to establish medical schools and to train the Chinese themselves in Western medicine. Recent events had necessitated the withdrawal of missionaries, and even of doctors from the hospitals, but this had allowed the Chinese to carry on by themselves in many places. He believed, however, that, communism having now spent itself, the Chinese for the first time had really come to find their own life and destiny.

Ireland.

MEDICAL SERVICES IN THE FREE STATE.

THE report read at the annual meeting of the Approved Societies Association of Ireland referred to the final report published by the Committee on Health Insurance and Medical Services. The report, signed by a majority, expressed the view that a comprehensive State medical service would be the ideal solution of the problems submitted for the consideration of the committee; but they were unable to recommend this on account of its cost (estimated at one and a half million pounds a year) and for various other reasons, the nature of which was not stated, but which Dr. Rowlette described as the lack of co-ordination between the administrative departments dealing respectively with local government and with national health insurance. Failing to carry a recommendation for the immediate establishment of a State medical service embracing insured persons and all "poor persons," and also failing to secure the inclusion of dependents in a medical benefit scheme, the majority of the committee finally recommended a limited scheme of medical benefit, applicable to insured persons only, with an increase of 2d. in the weekly contribution, to be borne equally by the employer and the employee. The Approved Societies Association had never any doubt as to the probable outcome of the inquiry. The failure to reach an agreement was anticipated when the constitution of the Committee of Inquiry was announced and it was found that approved societies were denied representation. If the Insurance Commission had supported the societies' demand, that it should be representative of all interests affected instead of setting up an interdepartmental scheme, it is probable that an agreed scheme would have emerged of a nature beneficial to the Irish working classes. This association claims to speak for 80 per cent. of the insured population, and felt that the time had arrived for a comprehensive reform of the Poor Law medical services. If that could not be achieved it favoured a scheme of medical benefit for insured persons and their dependants, and expressed its willingness, if necessary, to agree to an increase not exceeding 3d. in the weekly contribution. If even this scheme were not feasible, then, with the object of securing some immediate improvement of the existing condition of affairs, it was prepared to advocate a scheme of medical benefit for insured persons only at an additional contribution not exceeding 2d. a week. The Departmental Committee on Workmen's Compensation has expressed an opinion in favour of the establishment of a contributory scheme of medical benefit under the National Health Insurance Acts in the interests of disabled workmen. The final report favoured the discontinuance of the prolongation of the Insurance Act of 1921. This proposal was acceptable to the approved societies. It was anticipated that the effective membership would be reduced by about 20 per cent. as a result of the proposal. There was an abnormal increase in benefit payments in 1926 and 1927, as compared

with 1925, and there was reason to think that many societies were not referring their doubtful cases to the National Health Insurance Commission for examination by the medical referee, which was provided free of cost. The report also dealt with the inadequacy of the sanatorium benefit fund, in consequence of which insured persons affected were called upon to pay for treatment according to their means, notwithstanding that they had already contributed under the health scheme for sanatorium benefit.

Correspondence.

THE PHYSIOLOGY OF DEFAECATION: AND THE RELATIVE FIGURES OF GASTRIC, DUODENAL, AND JEJUNAL ULCER.

SIR,—Dr. L. J. Picton, in his interesting letter on the physiology of defaecation, which appeared in the JOURNAL of November 26th (p. 1005), erroneously gives me the credit of being the first to observe "mass peristalsis" in the colon. As a matter of fact the movement was discovered by Holzknecht of Vienna; his work was confirmed by Dr. A. E. Barclay of Manchester a few months before my earliest observations were made.

The gastro-colic reflex, which Alan Newton of Melbourne and I described in 1913, results in a deep peristaltic wave passing from any point in the colon for several inches towards the pelvi-rectal flexure; it rarely, if ever, starts in the caecum, as suggested by Dr. Picton, and the simultaneous movements he describes in the proximal and distal colon have, so far as I know, never been observed. Mass peristalsis after each meal results in the greater part of the contents of the intestines accumulating in the pelvic colon by the early morning. Getting up, having a bath, and eating breakfast together result in a wave of contraction passing down the pelvic colon, so that faeces enter the previously empty rectum; the desire to defaecate is now felt, and the defaecation reflex results in the evacuation of all the accumulated faeces. Consequently, under normal conditions, no further accumulation collects in the pelvic colon until the following morning, so that defaecation after every meal, as recommended by the New Health Society, is unphysiological, and its encouragement by irritating food is one of the chief causes of the recent increase in intestinal disorders.

O'Beirne in 1833 was the first to point out that the rectum is normally empty except immediately before defaecation, and that the faeces accumulate in the pelvic colon just above the pelvi-rectal flexure, which is marked on the inside of the rectum by the first of the folds described three years earlier by Houston, who started the erroneous idea that the lower two rectal folds also have the function of supporting the weight of the faeces.

In your account of the discussion of gastric and duodenal ulcer at the Manchester Medical Society (p. 988) Mr. A. H. Burgess is reported to have stated that "duodenal ulcer appeared to be much commoner than gastric ulcer in the North of England, whereas in London gastric ulcer was more common than duodenal." I do not know the source of his information, but my experience in hospital and in private practice does not agree with it. Dr. L. J. Barford and Dr. T. E. Jones have recently analysed the records at New Lodge Clinic; they found that since 1921 we have had 125 cases of duodenal ulcer, compared with only 33 cases of gastric ulcer, a proportion of nearly 4 to 1. Jejunal ulcers, which are almost always complications of gastro-jejunostomy performed for duodenal ulcer, account for no fewer than 32 additional cases, or only one short of the gastric ulcers; free hydrochloric acid was present in every instance, generally in excess, so that our investigations do not agree with those quoted by Mr. Burgess from the Mayo Clinic, according to which anacidity was present in 20 per cent. of 100 cases of jejunal ulcer.—I am, etc.,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, Nov. 28th.

GROWTH IN ITS PATHOLOGICAL RELATIONS.

SIR,—Very many years ago, when a final year student, I wrote a thesis, which I never attempted to publish, in which I argued that the problem of cancer should be approached by endeavouring to ascertain why the cells of a multicellular organism, presumably descended from a unicellular organism, should have lost the power of unlimited multiplication possessed by the latter. I suggested that this power was delegated to the sex glands and controlled by an inhibitory secretion of these glands. I had neither time, means, nor opportunity to pursue the idea. A perusal of Dr. Archibald Leitch's paper on growth in its pathological relations (November 19th, p. 929) emboldens me to make these additional suggestions:

That cell multiplication is controlled by a hormone system, including the sex glands and others—for example, the thymus.

That cancer may be due to a failure of this inhibitory hormone system; or

That it may be due to a new hormone produced by a senescent sex gland; or

That it is an attempt to produce another sex gland to replace a failing sex gland; or

That it is a hopeless attempt to produce another individual by a variety of parthenogenesis.—I am, etc.,

GORDON WILSON, M.B.

Thurlstone, nr. Sheffield, Nov. 21st.

RADIUM AND THE "SURGERY OF ACCESS."

SIR,—In your leading article on radium in the treatment of malignant disease (BRITISH MEDICAL JOURNAL, November 19th, p. 945) reference is made to the "surgery of access" and its relation to present-day results.

A brief survey of the evolution of radium surgery readily supplies the explanation of the excellence of the results now obtainable as compared with those of earlier days, and shows further that the "surgery of access" is a culminating point of a very definite series of steps, or periods, of progress in the treatment of cancer. In the first period treatment was essentially accomplished from the surface by means of plaques and large containers. This was followed by the second, the period of radium puncture, in which was the attempt to procure a homogeneous radiation of the malignant mass. This represented a considerable advance, but still there remained a large number of growths, particularly those deep seated, in which needling or homogeneous radiation was impossible. This led to the "surgery of access," the present period of radium surgery.

The three distinct principles of radium surgery thus evolved are: (1) The opening up of a way to the tumour. (2) The treatment of the tumour itself by radiation. (3) The application of radium to the lymphatic areas draining the tumour. To those of us engaged on this work, and who have for some time been endeavouring to awaken interest in the possibilities of these new methods in the treatment of cancer, the note of recognition in your leading article is specially welcome. We would commend to those who have not yet had the opportunity of studying first-hand the radium work of the schools of Paris, Stockholm, and Brussels a visit to the forthcoming International Congress of Radiology at Stockholm next summer, where opportunity will be afforded of seeing some of the work, not only of Heyman, but of the other pioneers in radium and radium surgery of the great Continental schools, to whom no one informed on the history of radium surgery can do other than pay humble homage.—We are, etc.,

ARTHUR B. SMITH, M.B., F.R.C.S.E.
SYDNEY M. SMITH, M.B., Ch.B.Ed.

London, W.1, Nov. 21st.

TREATMENT OF PROSTATIC ENLARGEMENT.

SIR,—After careful perusal of the very able Bradshaw Lecture by Sir Cuthbert Wallace on prostatic enlargement in your issue of November 19th (p. 907) one is left with a feeling of regret that no mention is made of treating the adenomatous prostate by radiotherapy. Reference is made to radiation in carcinoma of the prostate, but not in the simple enlargement in elderly men.

My own experience of this form of treatment has been exclusively in private practice, but the results have been so generally satisfactory that I have no hesitation in recommending it in cases where the amount of residual urine is small, and where examination justifies the opinion that there is a large excess of adenomatous over fibrous tissue. Personally I always use a deep-therapy apparatus, and treat one field through the perineum, giving 90 per cent. U.S.D., and two or three suprapubic fields, carefully focusing the central ray on the prostate by Chaul's method. For the perineal application I have devised a high stool with an opening in the seat, so that the patient can be treated in a sitting posture, and so avoid the lithotomy position.

It has been said that *x*-ray treatment, by causing fibrous adhesions, renders difficult a subsequent operation. One of my patients was an elderly man, who wanted to do everything possible to avoid operation. I gave him two series of treatments, but failed to benefit him, and he had to undergo prostatectomy. The surgeon informed me that the operation was no more difficult than usual, and that there were no adhesions. This is the only one of these patients I have treated who has, as far as I know, been operated upon, and, though I am aware one cannot draw conclusions from a single case, I think I am justified in recommending so simple a treatment being tried before subjecting an elderly man to the shock and discomfort of a severe operation.

It would be most interesting and instructive if a series of suitable cases of prostatic enlargement could be treated by radiation at some large hospital, and the results noted, and I feel sure that all radiologists will echo Sir Cuthbert Wallace's wish "that someone who has the means would, by his generosity, render possible a more intensive study of the subject."—I am, etc.,

Cheltenham, Nov. 23rd. J. CURTIS WEBB.

TREATMENT OF CANCER BY RADIUM.

SIR,—In your leader "Treatment of rectal cancer by radium" in the JOURNAL of November 19th (p. 945) you infer that the reason for the want of complete unanimity upon the value of radium in cancer of the cervix is that some surgeons have not had or not taken the opportunity of seeing what is being done in London, Manchester, Stockholm, Paris, Brussels, and many other centres.

One of my cases of carcinoma of the cervix was, I believe, the first one to be treated at the Radium Institute in Manchester in 1914, and since that date I have taken the greatest possible interest in the results obtained by radium, but unfortunately have to form my judgement upon the results obtained in my own cases, as I know of no statistics published in this country upon which a judgement can be made. To state that a number of cases are well at the end of one or two years, or that a few are alive after longer periods, without a statement of the number of cases treated, is useless. When statistics are published in this country showing that cases of carcinoma of the cervix treated by radium have as high a percentage of non-recurrence after five or ten years as have those treated by Wertheim's hysterectomy, I will most gladly abandon this operation, which until then I feel compelled to advise and perform.—I am, etc.,

Manchester, Nov. 23rd. WM. FLETCHER SHAW.

UNIFICATION OF LOCAL HEALTH SERVICES.

SIR,—I read with interest the account in the JOURNAL (November 19th, p. 924) of the paper read by Dr. Macgregor at Edinburgh on the unification of local health services. It is satisfactory to note that in the discussion which followed most of those taking part emphasized the importance of pressing forward with unification.

This is a matter which does not concern only, or even chiefly, those members of the medical profession engaged in whole-time or part-time public health work. The activities of the Ministry of Health and local authorities affect all doctors in various ways, a fact which will be more and more realized as time goes on.

My own experience in these matters is based on membership of the Cambridgeshire county council, and various committees of that authority concerned with health matters—namely, public health and housing, tuberculosis, milk and dairies, Midwives Acts, and maternity and child welfare. In addition I happen to be chairman of the Local Medical and Panel Committee and vice-chairman of the County Insurance Committee.

In taking part in the proceedings of these committees I have often been impressed with the manner in which the work of them all is linked up; they are, in fact, not independent but interdependent bodies, and therefore should not be each a separate statutory committee, but a subcommittee whose duty it should be to report its proceedings to the local health committee of the area.

The policy of the British Medical Association to endeavour to promote the establishment of such local health committees, analogous to the local education authorities, is sound. It is, however, unfortunate, I think, that the term "abolish" has been used in connexion with insurance committees. These could be retained on much the same lines as the present ones, and in each case made a subcommittee of the main health committee. It is agreed that the administrative work of insurance committees generally can compare favourably with that of most local authorities.

With regard to medical representation on the local health committee, there is no doubt that co-option of some medical men would be permitted, in the same way as persons of special experience are now co-opted on to local education committees. It must be remembered, however, that co-option on a large scale is not popular with elected members of local authorities, who object to persons who are not responsible to the ratepayers for their actions having too much influence upon their deliberations.

Medical men should not be content to leave the administration of their affairs in the hands of tradesmen, lawyers, farmers, and persons of independent means, but should themselves become members of local authorities as the chosen representatives of the people. Some object on the ground that they are thereby liable to become involved in political issues; but politics play really a very small part in the work of local authorities after election, and, in any case, a strong personality and honesty of purpose will frequently triumph over political prejudices. Our Association should, moreover, as far as possible, see that medical men are not penalized by membership of local authorities.

It will be remembered that the Association played no inconsiderable part in the establishment of the Ministry of Health. It is unfortunate that so many of the functions of the old Local Government Board, not immediately connected with health matters, were taken over by the new Ministry of Health, instead of being transferred to other departments of the State. We should continue to press for rectification of this as well as for unification of all health services locally, in any scheme of reform of local government that is proposed.

Administratively a county council area would possibly be the most convenient in most cases for the scope of a local health committee, but where an important borough is situated within the area it might administer its own health matters, as it does its education affairs.—I am, etc.,

ROBERT ELLIS.

Cottenham, Cambs, Nov. 21st.

MEDICAL CONFIDENCES.

SIR,—My appreciation and gratefulness for the attitude taken by Dr. E. Graham Little, M.P., on behalf of the ethical rights of our profession was mingled with some amazement because of the advice of the distinguished lawyers of the House to restrict the privilege "to the special case of venereal diseases."

Is it not evident that, if the privilege from disclosure in evidence is thus restricted, in each case that a medical man should lay claim to such a privilege, the fact that the person concerned is suffering from a venereal disease is *eo facto* disclosed and the privilege frustrated? If the decision of speaking or remaining silent be not delivered to the discretion of the medical man there is no real safeguarding of the patient's confidences.

The High Court of the Netherlands has decided so on

April 1st, 1913, "because only thus it can be prevented that the patient or his family should restrain themselves from seeking medical aid for fear of disclosure of their secrets" (that is to say, all that the medical man hears, sees, or observes in the exercise of his profession, and that by its nature is to be regarded as secret).

This verdict has been provoked by a medical man, who had refused evidence before the judge, was therefere condemned to prison, and had appealed to the courts. This attitude might be recommended everywhere.—I am, etc.,

Amsterdam, Nov. 26th. H. PINKHOF, M.D.

SIR,—I am not only expressing my own opinion, but also that of many medical men with whom I have discussed the matter, when I say that far too much is being made of what is called "medical privilege." The cases where medical men have to reveal in court confidences reposed in them, or knowledge acquired by them in the course of their professional work, are few and far between.

Honour alone would compel one to keep any confidence sacred, but a great deal too much importance is laid upon one's subscription to the Hippocratic oath. There is little doubt but that this was intended to be a short guide to medical conduct and included a warning against the only too common fault of gossiping, not only about one's own patients, but about folks generally; "whatever in connexion with my professional practice *or not in connexion with it*, I hear or see in the life of men which ought not to be *spoken of abroad*, I will not divulge, as reckoning that all such should be kept secret." In the Sponsio Academica of some universities one affirms that "not without grave consideration shall one divulge anything seen or heard regarding one's patients." Many medical men subscribe under the Promissory Oaths Act of 1868 that they will keep silence as to anything which they have seen or heard while visiting the sick which it would be improper to divulge.

Such instruments merely counsel the keeping of confidences, but make no absolute prohibition as to the divulging of information when it is deemed necessary, as, for example, in the furtherance of justice. It is not for the medical witness to determine whether a question is unnecessary or even harmful to others, and to refuse to answer is surely to put oneself on a higher level than the accredited representative of the King, who, one is confident, will not allow such questions to be put without a sufficient cause.

In many cases, however, it is unnecessary that there should be any publicity, as the answer can be made in writing and handed to the judge, or, as has been suggested, the case can be heard *in camera* at the discretion of the judge. Doubtless in a few cases hardship might result from a public disclosure, but might not far greater injury arise if medical privilege were allowed and no information were forthcoming? In criminal cases the medical evidence may be the solo guide which would lead to a conviction, and in cases of divorce, legitimacy, etc., the suppression of evidence which the medical attendant could alone give might very easily lead to miscarriages of justice.

It is a trito remark that medical men are not expected to act as detectives, but it is surely their bounden duty as mere members of the community to inform the public prosecutor of any crime which may come under their cognizance. If this were borne in mind it would not be necessary for circulars to be sent or notices to appear in the public press calling on medical practitioners to help the police in certain cases. A very eminent judge once said: "I care not for professional etiquette or professional rule. There is a rule of life and a consideration that is far higher than these, and that is the duty of every citizen of this country—that any right-minded man owes to his neighbour—to prevent the destruction of human life in this world."

It is mainly in connexion with the Venereal Diseases Regulations that the question of medical privilege has lately arisen, but when the judge accepts written statements (for example, the card itself) or information obtained by conversation with the medical witness in private, then in my opinion we ought to accept the law as it stands, and not make a demand for privileges which are not extended to others.—I am, etc.,

W. G. AITCHISON ROBERTSON.

Boscombe, Hants, Nov. 26th.

SIR,—At a meeting of the Bournemouth Division of the British Medical Association, held last evening, in conjunction with the Bournemouth Legal Society, the subject for discussion was, "Should communications to a medical man be privileged in legal procedure, both civil and criminal?"

The two chief speakers for the Legal Society were Mr. E. W. Marshall Harvey and Mr. W. E. D'Angibau; while for the Division Dr. E. K. Le Fleming and Dr. G. K. Morse were chosen. Unfortunately Dr. Morse was unable to attend, and at almost the last moment I was asked to take his place. I was not at the Annual Meeting at Edinburgh, but a couple of hours before I had to speak I had sent me the Association's *Handbook* for 1927-28, in which I saw a short synopsis of the attitude of the B.M.A. on this subject.

Dr. Le Fleming opened the discussion in a most able and concise manner, but as it far exceeded the time allowed I had to limit my observations to some five minutes, and I therefore feel justified in asking your kind indulgence to put briefly my very definite views on this burning subject.

There can be no question that forty years ago judges and counsel were far more inclined to respect medical secrecy than they are to-day, and I mentioned two cases to prove my contention, one in the Civil Court and one in the Criminal Court, between 1882 and 1887.

The first case was in the Divorce Court, before Mr. Justice Hannen, Mr. Inderwick leading for the petitioner, a lady in good social position. She pleaded, as grounds for divorce, adultery and cruelty, the latter being syphilis, given her by her husband. The doctor who had to give evidence on her behalf was also the medical man of the husband. Before the case came on for trial the husband defied the medical man to state that he had attended him for syphilis, and Mr. Inderwick, at the last conference, contended he could not ask the doctor any questions as to respondent's health without his permission. With great difficulty, and at the last moment, the respondent withdrew his objection, and the lady obtained her divorce.

In the other case, before Baron Field, a young man was on trial for murder. A week before the date of trial the solicitor for the defence discovered by chance that the mother of the prisoner had been an inmate of a private asylum in a condition of acute mania during her pregnancy, and her son (the murderer) was born soon after her discharge. Nothing would induce the father to allow this evidence to be given, but the solicitor decided to have the medical superintendent of the private asylum present, with the books to prove the admission of this lady and her condition while there, in case the father should reverse his decision. At the final conference between the alienists who were giving evidence and the two counsel engaged for the defence, Mr. T. Bucknill (afterwards Sir Thomas Bucknill, Judge of the High Court) and Mr. Charles Mathews (afterwards Sir Charles Mathews, Public Prosecutor), both decided that the evidence of residence in the asylum of the murderer's mother could not be given unless the father gave his consent. At the very last moment this consent was given, and the evidence in court had, we all knew, much to do with the jury's verdict, "Guilty, but insane," in spite of a strong summing-up by the judge against such a verdict.

The attitude of Bench and Bar has greatly changed since those days, and Mr. Justice McCardie's judgement as to medical privilege has never been appealed against, and still holds good; hence the strong feeling of the medical profession, and the urging by them of some alteration in the law regarding medical privilege.

Personally I, from my many years' experience, cannot see eye-to-eye with the attitude taken up by the British Medical Association on this question. No general law can be laid down. Each case must be decided on its merits, and, above all, medical men must look upon themselves not only as medical men, but as citizens with a duty to help justice in our courts of law and to protect society.

Lord Riddell, in a paper read last June before the Medico-Legal Society on "Medical secrecy," very clearly put it

when he asked himself the following questions: (1) What may a doctor tell? (2) What should a doctor tell? and (3) What must a doctor tell? I think he might have added, What must a doctor not tell? It was clear to me that in stating cases to enable him to answer these questions he quickly came to the conclusion that each case had to be judged on its own merits. One of the medical men was loudly applauded by his medical brothers when he said he should always be guided by his own conscience with regard to disclosing medical secrets, and would willingly go to prison if his determination not to answer certain questions was considered contempt of court. I had no opportunity of replying to this statement, but if I had had, I should have been obliged to ask him what he would do if the judge considered his conscientious objection seriously militated against justice being done; and I think I should have gone further, and stated my opinion that any such martyrdom would do no more good towards obtaining our privilege than the Welsh miners' recent march to London did towards obtaining for them employment.

In the matter of disclosure by medical men conducting venereal diseases clinics I am whole-heartedly in favour of Dr. Graham Little's private bill, which I hope he will soon see duly passed by Parliament, for two reasons: Because it is absurd and illogical for a Government department (the Ministry of Health) to demand an undertaking of secrecy from all who are doing this grand work while the law insists upon these medical men breaking this oath. Because if we desire, as I am sure we all do, to see this awful, this cruel, scourge of syphilis greatly mitigated, we should do all in our power to encourage the victims to place themselves quickly under treatment. Were it not for the absolute secrecy now demanded by Government from medical men, I am certain not one-tenth of the persons at present attending these clinics would do so.

Finally, I put forward two suggestions:

(1) That each case must be judged on its own merits.

(2) That, in all cases where medical secrets are ordered by judges to be disclosed in the interest of justice and for the protection of society, such evidence should be heard *in camera*.—I am, etc.,

Bournemouth, Nov. 22nd. LIONEL A. WEATHERLY, M.D.

*** A report of the meeting referred to by Dr. Weatherly appears in the SUPPLEMENT this week at page 216.

A TREATMENT OF MORPHINISM.

SIR,—In your issue of November 5th (p. 827) Dr. Laughton Scott states that morphinists treated by a modified atropine method do not suffer at all, and, what is more interesting, that after treatment they stay cured. Does Dr. Laughton Scott consider that the injection of a drug, or even drugs, for a week or two is going to influence the after-history of a patient permanently by conferring a kind of immunity?

Further, with regard to atropine, most morphinists state that atropine added to their dose of morphine does not in any way replace the morphine, but simply lessens its effect, thus necessitating a larger dose of morphine. If this is true, what use is atropine in treatment apart from the delirium it produces? If its sole use is that it lessens the suffering by making the patient delirious, other drugs would be equally effective. In reality there should be no suffering, and in the majority of cases it can be avoided by simpler methods than making the patient delirious.

Again, is it not almost an axiom that the shorter the treatment the quicker the relapse? Surely, speaking broadly, the after-treatment is the determining factor of relapse, and few patients will submit to prolonged after-treatment. Hence the failures.

I can claim an even longer series of unrelapsed cases, but attribute the permanency of the cure to several factors, one of which is the lack of opportunity to procure the drug. Does Dr. Laughton Scott take this factor into account in his cases?—I am, etc.,

Paignton, Nov. 7th. STANFORD PARK.

THERAPEUTIC ABORTION.

SIR,—Dr. Dunlop (November 12th, p. 901) writes that abortion (other than therapeutic) "is . . . illegal, except perhaps in cases of pregnancy following rape." This possible exception is new to me, and I think an authoritative opinion on the point would be welcomed.

Many years ago I attended a Dutch girl who had been raped by a Kaffir: the delayed after-coming head presented a nice problem, and I think my conscience would not have worried me had I not saved the child by forceps delivery. But I doubt very much whether the law (Roman Dutch) would have been as tender with me had I interrupted the pregnancy at an earlier date.—I am, etc.,

Topsham, Devon, Nov. 14th. R. CARMICHAEL WORSLEY.

Medico-Legal.

BRITISH MEDICAL ASSOCIATION *v.* THE "DAILY NEWS," LIMITED.

ACTION FOR LIBEL SETTLED.

Disclaimer by Defendants.

IN the King's Bench Division, before the Lord Chief Justice (Lord Hewart), on November 29th, the case of British Medical Association *v.* "Daily News," Limited, arising out of a paragraph published in the *Star* newspaper, was mentioned, and it was announced that the action had been settled, the defendants agreeing to publish a disclaimer, which was read in court.

Mr. Stuart Bevan, K.C., and Mr. H. C. Dickens appeared for the plaintiffs, instructed by Messrs. Hempson. The defendants were represented by Mr. Norman Birkett, K.C., and Mr. H. M. Giveen, instructed by Messrs. Lewis and Lewis.

On his lordship taking his seat, Mr. Stuart Bevan said: This is an action brought by the British Medical Association, for whom I am appearing, with my friend Mr. Dickens, against the "Daily News," Limited. The action is in the special jury list, and is an action for libel. The plaintiff Association has a very large membership of medical men—a membership, I think, of more than 33,000—and it is an Association which is established to promote the medical and allied sciences and to maintain the honour and interests of the medical profession. The Association is recognized by the public and by the Government as representative of the views and interests of the medical profession in this country. The defendant company are the proprietors of the *Star* newspaper, and on September 2nd, 1926, in the issue of the *Star* for that date there appeared the following article under the heading of "Doing without it":

"Our American cousins have an expressive figure of speech about the man who 'bites off more than he can chaw.' It might be applied with justice to the British Medical Association. While it confines its oppressive activities to bone-setters and other unregistered practitioners who could be dubbed quacks without fear of legal reprisals it was able to get away with it. Any criticism of its conduct could be contemptuously swept aside as the uninformed prejudice of the mere layman. When, however, it tried to discipline distinguished members of its own body it did in fact bite off more than it could chaw. Sir William Arbuthnot Lane, the President of the New Health Society, is the case in point at the moment. The B.M.A. does not like the society, for its motto is 'Prevention rather than cure.' To preach 'health without doctors' is the unforgiveable sin to the medical monopolists, who have in the past imposed a very rigid etiquette of secretiveness on their close profession. Sir William appears to have had the courage to defy these out-of-date conventions, and, contemptuous of the B.M.A.'s power to strike him off its register, is reported to have struck himself off. The B.M.A. can do—just nothing."

My lord, the plaintiff Association and its advisers regarded that article as seriously defamatory of the Association, and of its policy and of its methods, and it was their feeling that there was no alternative but to institute proceedings against the *Star* newspaper. Many of the statements in that article are inaccurate; the whole of the comments we conceive to be entirely unjustified. But without waiting for the action to come to trial, the

defendants' advisers have submitted to the plaintiffs a statement which they are prepared to have read in court and which they have undertaken to publish in an issue of the *Star* newspaper. In these circumstances my clients, who have never desired to obtain damages in this matter, but were solely concerned—and deeply concerned—with the establishment of their integrity and the vindication of their policy, accept the statement which is made in satisfaction of their action. They make, as I say, no claim to damages, and they accept the statement. The statement, which it is agreed I shall read, with your lordship's permission, is in these terms:

The Star's Disclaimer.

"It has been pointed out to us that an article published in the *Star* of September 2nd, 1926, on the subject of the New Health Society and the retirement of Sir William Arbuthnot Lane (first President of that Society) from membership of the British Medical Association, has been construed as imputing improper motives and behaviour to the British Medical Association—particularly that the Association was oppressive upon medical practitioners, registered as well as unregistered; that its hostility to the educative methods of the New Health Society arose from a desire to prevent any improvement in the public health because this would involve loss of fees to medical men; and that the Association was actuated solely by the desire to benefit the medical profession without any regard whatever to public health or public interest.

"We disclaim the intention of making any such imputations, and we are fully satisfied that such a conception of the work and outlook of the British Medical Association would be wrong in fact and unjust; and we regret any wrong impression which the publication of the article may have created."

As a matter of fact (Mr. Stuart Bevan continued) the British Medical Association has itself been much concerned—and has caused research work to be undertaken—in the prevention of disease. We are glad, of course, to have this statement; and, subject to your lordship's approval, the action will be discontinued. As to the costs, which are a small matter having regard to the gravity of the case, each party is content to bear its own.

Mr. Norman Birkett said: I appear with my friend Mr. Giveen for the defendants. It only remains for me to say that I agree with the statement of the terms of settlement as outlined by Mr. Bevan, and that we are glad that the proceedings have terminated in this manner.

His lordship indicated his assent to the discontinuance of the action.

PARTICULARS OF DOCTORS' ACCOUNTS.

A DIVISIONAL Court of the King's Bench Division (consisting of Salter and Talbot, JJ.) on November 22nd held that it was sufficient for a general medical practitioner, in rendering his account to a patient, simply to specify the date and fee charged per visit, and not to be compelled to render particulars of the treatment or advice given to the patient at each visit.

The point arose out of an application made, *ex parte*, by counsel on behalf of Mrs. Dorothy Anstey, the wife of a solicitor living at Maidenhead, for leave to appeal from an order of the judge of the Windsor County Court, reversing the Registrar's order, which required the plaintiffs, Messrs. Moore, Moore, and Foote, general medical practitioners of Maidenhead, to deliver particulars of their account showing the treatment or advice given to the plaintiff at each visit. The defendants had given the dates, and fee charged per visit.

Counsel said Mrs. Anstey was suffering from a bad mouth caused by a decayed tooth, and Dr. Foote, one of the defendant partners, attended her to a dentist's, where gas was administered. Dr. Foote, however, further advised Mrs. Anstey to undergo a private examination. Counsel had applied for the matter to be tried in the High Court.

Mr. Justice Salter thought that the doctors would agree to that if charges of medical misconduct were made.

Counsel said he wished the doctor to say whether he was attending Mrs. Anstey for anything besides a bad mouth, for, if that was all, there would be no necessity for him to go to her flat six times.

The Court, dismissing the application, said that if doctors were called on when sending in their bills to explain the particulars of each visit they could not carry on business.

Obituary.

JOHN CARLYLE JOHNSTONE, M.D.,

Late Medical Superintendent, Roxburgh District Asylum.

MANY of the older practitioners in the Border districts of Scotland, and his colleagues in his specialty, will have heard with great regret of the sudden death of Dr. J. Carlyle Johnstone, for many years the medical superintendent of the Roxburgh District Asylum. He had been paying his annual visit to several of his old friends, to whom he appeared to be in particularly good health and spirits, but while staying with a medical friend in Edinburgh he succumbed to a sudden and unexpected heart attack. His loss is keenly felt by many of those brought professionally into contact with him, and by his colleagues and former assistants, who were attracted by his kindly disposition and good qualities of head and heart, and became firm friends for life. Cultured and widely read, and unassuming in character, he was always ready to place his experience and knowledge at the disposal of anyone who sought his advice and guidance, and his best memorial is the institution which he served so long and so well, and which, under his able management, became a model of what such an institution should be.

He was born at Wolfelee Manse, Hobkirk, Roxburghshire, on May 27th, 1855, and was educated at private schools in England, Dumfries Academy, and Glasgow University, where he graduated M.B. and C.M. with honours in 1877, having gained distinction in most of his medical classes, and winning five medals. In 1892 he obtained the degree of M.D., his thesis, on sulphonal, being marked with "Commendation." In 1878 he was appointed assistant medical officer at the Fife and Kinross Asylum, and in 1880 he became assistant physician at the Royal Edinburgh Asylum, under the late Sir Thomas Clouston, to whom he gave some assistance in the preparation of his *Clinical Lectures* for publication. In 1885 he was appointed medical superintendent of the Roxburgh District Asylum at Melrose. During his term of office it was found necessary to add largely to the accommodation; fresh land was purchased, a new and satisfactory water supply was obtained, and electricity installed. Dr. Johnstone was greatly interested in the question of the nursing of the insane, and devoted much of his energies to the training of his nursing staff. He was partly instrumental in securing the passage of the Act under which service in the Scottish District Asylums became pensionable. He contributed several papers to the *Journal of Mental Science*, and drew up a scheme of practical training for those engaged in mental nursing, which was found useful in other institutions. He also took an active part in the doings of the local Division of the British Medical Association, represented his Division on the Edinburgh Branch Council, was a strenuous advocate of the interests of the profession at the time of the passing of the National Health Insurance Act, and was elected by the county council as a medical member of the Roxburgh County Insurance Committee.

Being compelled by rheumatic troubles to tender his resignation in March, 1917, after a period of treatment at Bournemouth and Droitwich he took up work again in July of the same year as junior assistant physician at Craig House Mental Hospital, under Dr. G. M. Robertson, and remained there until some months after the armistice. The last few years he spent mostly at Droitwich.

His private interests were chiefly literary and artistic. He is survived by his wife, a daughter of Deputy Surgeon-General Andrew Fleming, Bengal Army, and a son and daughter, the former a member of the Kenya Colony Medical Service and at present medical officer of health at Nairobi, the capital town.

DR. FRANCIS WILLIAM UNDERHILL, who died at Maidenhead on October 31st, aged 83 years, was a student of St. George's Hospital, and obtained the diplomas of M.R.C.S.Eng. in 1865 and L.S.A. in 1866. He took the Fellowship of the Royal College of Surgeons, Edinburgh,

in 1884. At St. George's he was senior prizeman in anatomy, medicine, surgery, and midwifery, and won other distinctions. He had held the post of demonstrator of anatomy at St. George's Hospital School of Medicine, and was for some time prosector in the museum of the Royal College of Surgeons. He served for many years as honorary secretary of the St. George's Hospital Medical Society. On leaving London he went to practise in Birmingham, and became honorary consulting surgeon to the Moseley Hall Convalescent Home for Children. Dr. Underhill retired from active work about twenty years ago, and settled in Maidenhead, where he kept a private home for feeble-minded adults. His quaintly attired figure and old-world courtly manner made him a well known figure in Maidenhead. He took an active interest in the social life of the town, and was for some years connected with the working boys' club as secretary and treasurer. He was a member of the Windsor Division of the Oxford and Reading Branch of the British Medical Association, and a regular attender at its meetings. On the formation of the new Windsor Division Dr. Underhill entered into its activities with enthusiasm, and although over eighty years of age drove long distances to attend committee meetings. His long experience of administration and his encouragement did much to help the newly appointed officers. During his years of active practice in the Midlands he had served for some time as treasurer of the Birmingham Branch. He was a respected senior sidesman in St. Luke's Church, Maidenhead, and had been one of the managers of the Church of England schools. His wife died a few months ago, and he is survived by a son and daughter.

Widespread regret has been expressed at the news of the sudden death of Dr. JAMES MELVIN, late of Rochdale, on November 3rd, at the age of 66. Dr. Melvin received his medical education at Aberdeen, where he graduated M.B., C.M. in 1887. After holding an assistantship at Ramsbottom, near Bury, he began practice in 1890 in Rochdale. On his retirement in 1920 the practice was taken over by his nephew, Dr. James Melvin, jun. Dr. Melvin devoted himself whole-heartedly to work on behalf of the British Medical Association, and was honorary secretary of the Rochdale Division for twenty years, until his death. He was deputy representative for the Division from 1919 to 1924, and a representative from 1925 to 1927. He was also a member of the Lancashire and Cheshire Branch Council from 1925 to 1927, and vice-president of the Branch in 1925. Dr. Melvin was a representative of the Rochdale Medical and Panel Committee, and attended the annual panel conference in London shortly before his death. He took a keen interest in the St. John Ambulance Brigade, and was one of the leading members of the Trinity Presbyterian Church in Rochdale, and treasurer of the Rochdale Town Mission. He leaves a widow, with whom deep sympathy is felt.

The following well known foreign medical men have recently died: Dr. HERRGOTT, formerly professor of obstetrics and gynaecology at the Nancy Faculty of Medicine; Dr. FRANZ PENZOLDT, formerly professor of internal medicine at Erlangen, aged 78; and Professor E. ZETTNOW, formerly head of the department of microphotography at the Robert Koch Institute, Berlin, aged 85.

Universities and Colleges.

UNIVERSITY OF OXFORD.

AT a congregation held on November 26th the degree of Doctor of Medicine (M.D.) was conferred on B. C. Scholefield.

Radcliffe Travelling Fellowship.

An examination for a Radcliffe Fellowship of the annual value of £300, and tenable for two years, will be held during Hilary term, 1928, commencing on February 14th, at 10 a.m. Candidates, who must not have exceeded four years from the time of passing the last examination required for the degree of Bachelor of Medicine, should send their names, addresses, qualifications, etc., to the Regius Professor of Medicine, University Museum, on or before February 1st.

George Herbert Hunt Travelling Scholarship, 1928.

This scholarship is awarded without examination every second year to a graduate in medicine of the university (of either sex) who has not exceeded five years from the date of passing the final examination for the degree of Bachelor of Medicine. The next election will be made in April, 1928. Candidates must send their applications to the Dean of the School of Medicine, University Museum, Oxford, from whom full particulars can be obtained, on or before February 14th, 1928.

UNIVERSITY OF EDINBURGH.

THE chair of forensic medicine, vacant by the death of Professor Harvey Littlejohn, has been filled by the appointment of Dr. Sydney A. Smith, at present principal medico-legal expert to the Egyptian Government Service, and professor of forensic medicine in the Cairo School of Medicine. Dr. Sydney Smith is a former Vans Dunlop scholar and Gunning prizeman in the University of Edinburgh; he graduated M.B., Ch.B. with first-class honours in 1912, and proceeded M.D., winning the gold medal in 1914. He is the author of a textbook on forensic medicine, and in January, 1926, contributed an article to the BRITISH MEDICAL JOURNAL entitled "The identification of firearms and projectiles as illustrated by the case of the murder of Sir Lee Stack Pasha." According to a Reuter's telegram he will leave Egypt to take up his new duties at the end of March.

SOCIETY OF APOTHECARIES OF LONDON.

THE following candidates have passed in the subjects indicated:

SURGERY.—E. E. Bowen, W. B. Hallums, H. T. Ince, M. H. Rashwan, H. T. Rylance, M. E. Tscheuschner, T. de L. Walker, R. W. Wood.
MEDICINE.—A. F. J. D'Arcy, P. F. Fanaken, T. M. Joseph, I. O. B. Shirley, M. E. Tscheuschner.
FORENSIC MEDICINE.—A. F. J. D'Arcy, P. F. Fanaken, L. W. Sanders, M. E. Tscheuschner, J. L. M. Wood.
MIDWIFERY.—J. S. Bury, G. N. Fox, A. Hamid, T. M. Joseph, A. K. Rama Chandra, M. E. Tscheuschner.

The diploma of the Society has been granted to Messrs. A. F. J. D'Arcy, P. F. Fanaken, T. M. Joseph, M. E. Tscheuschner, and T. de L. Walker.

The Services.

ROYAL AIR FORCE MEDICAL SERVICE.

THE annual dinner of the Royal Air Force Medical Service was held at the Connaught Rooms, London, on November 25th, with the Director, Air Vice-Marshal DAVID MUNRO, C.B., C.I.E., in the chair. In proposing the health of "The Guests"—for whom Lieut.-General Sir MATTHEW FELL, Director General, Army Medical Service, responded—Air Vice-Marshal MUNRO made a few prefatory remarks about the present position of the service of which he is the head.

The chief difficulty of the moment, he said, was shortage of personnel, but the causes of this were general to all the medical services and not peculiar to the Royal Air Force. Indeed, so far as the R.A.F.M.S. was concerned, he saw distinct signs of improvement in recruiting. Apart from that, two things had happened which would make any shortage less acutely felt. The first was a change in the proportion of officers serving overseas to those at home, due to reductions in Iraq and expansion at home. The second was an increase in the authorized proportion of permanent officers. Both these factors would operate in diminishing the number of moves, increasing time spent at home, and giving more opportunities for study leave. In regard to study leave, one of the ways in which the R.A.F.M.S. had felt its shortage and frequent changes of personnel had been the difficulty of selecting for training the young permanent officers to replace later on those engaged in various branches of professional work requiring expert knowledge and experience. Good surgeons, pathologists, and physicians were essential in the hospitals, and experts were needed in various special branches of medicine, as well as in the medical and physiological problems peculiar to aviation. The service already possessed such experts, but to maintain the flow of them men must be chosen at an early stage of their service. At the top end of the flow, so to speak, there were posts in the higher ranks reserved for promotion for purely professional, as opposed to administrative, attainments. As for the medical officers stationed on aerodromes, often single-handed, and forming the majority of the service, although they got practice quite up to what might be called the general practitioner and medical officer of health standards, though less onerous, in their sick quarters, among the wives and families of the station, and in preventive medicine, their service duties otherwise were apt to become monotonous. An endeavour was being made to give them better professional opportunities by removing the ban on keeping any but the lightest cases in sick quarters, and encouraging them to use these more as cottage hospitals. To this end the equipment

of sick quarters was being revised, and arrangements were in hand to lend extra staff when required. In various other ways they were trying to help the medical officers on stations.

In conclusion, the Director mentioned two other happenings of the last year. One was the opening of a fine modern hospital at Halton, which would undoubtedly become the chief medical centre of the R.A.F. The other was the starting at Halton of the medical training depot for medical officers and medical airmen.

THE R.A.M.C. ASSOCIATION.

THE Royal Army Medical Corps Association was formed in 1925 with the following objects in view: (1) To foster *esprit de corps*. (2) To develop and maintain friendship between present and past members. (3) To assist in obtaining employment for its members. (4) To assist or bring to the notice of the R.A.M.C. Fund Committee or other organization, any case of members, widows, or orphan children of members, who may be in necessitous circumstances and deserving of assistance. (5) To organize periodical reunions and social functions for the mutual benefit of members in the various districts where branches of the Association are established.

The president is the Director-General A.M.S., and the honorary treasurer is Colonel H. Knaggs, C.B., C.M.G.

The Association as a whole is controlled by a central committee, with offices at 76, Claverton Street, S.W.1, and each branch is managed by a local committee. All ranks of the R.A.M.C. and of the Army Dental Corps, including officers, are eligible for membership. An important part of the Association's work consists in helping its members to obtain civil employment, and medical practitioners and hospital secretaries requiring men trained in all branches of hospital work—dispensers, clerks, laboratory assistants, porters, caretakers, etc.—are invited to apply to the secretary at the head office.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

THE House of Commons this week made slow progress with the Unemployment Insurance Bill. There is scarcely any hope of sufficient agreement between friends of county councils and those of lesser local bodies to justify the Government attempting to pass the Nursing Homes Bill this year, but the opposition to the Mental Deficiency Bill is less numerous, and that measure has a better chance of becoming law.

At a meeting of the Parliamentary Medical Committee on November 24th Dr. Graham Little resigned the office of secretary to the committee, and Dr. Vernon Davies accepted an invitation to carry on the duties provisionally till the end of the session. The committee discussed the position of the Mental Deficiency Bill and of the Nursing Homes Bill.

Small-pox.

The number of cases of small-pox notified in England and Wales during recent months was considerably smaller than the number notified in the early months of this year. When the report of the Committee on Vaccination, appointed last year, was likely to be issued could not yet be stated. The carcasses of calves slaughtered after the production of lymph and certified as healthy are at the disposal of the person who supplied the calves. Those sold for food are subject to further examination by officers of local sanitary authorities.

Sir Kingsley Wood has stated, in reply to questions, that the Minister of Health had considered the suggestion that he should discontinue the practice of printing a form of declaration objecting to vaccination on the vaccination form handed to the parent when the birth of a child was registered, and should revert to the former practice of simply printing a notification on the vaccination form that if the parent had a conscientious objection to vaccination he could obtain a form of declaration to that effect from the vaccination officer. The Minister of Health, however, had come to the conclusion that it was not advisable to make any further changes in law or practice until he had had an opportunity of considering the report of the committee presided over by Sir Humphry Rolleston, which, it was expected, would shortly be issued.

Mr. Chamberlain informed Captain MacMillan on November 28th that he had no official information on the cost of the recent outbreak of small-pox in the Easington Union of the County of Durham. The returns made to his department showed that no person under 15 years of age, who had been vaccinated prior to infection, contracted small-pox.

Nursing Homes and Mental Deficiency Bills.—On November 28th Mr. Baldwin, replying to Dr. Vernon Davies, who asked if he would grant facilities before the end of the session for the Nursing Homes (Registration) Bill, said that he could make no promise in regard to time being given for private bills. The final decision must, of course, depend on the state of business. In a previous reply to Sir Herbert Cayser Mr. Baldwin said the Government might be able to find time for the Mental Deficiency Bill, subject to the state of business.

Notes in Brief.

One firm in this country has commenced blending tetraethyl lead with petrol on a commercial scale. The Factory Department of the Home Office is satisfied that adequate precautions are being taken for protecting workers concerned in the process.

The total cost of administration of National Health Insurance, including the cost of central administration, was £5,060,000, or 13½ per cent. of the total expenditure.

Rates collected in England and Wales during the year ended March last amounted to £159,500,000.

Since April, 1924, the Exchequer has paid £103,000 towards slum clearances.

On November 5th last 29.8 per 1,000 of the estimated population of England and Wales were receiving Poor Law relief. This does not include lunatics, casuals, and persons in receipt of domiciliary medical relief only.

Forty-two authorities in England and Wales maintain open-air schools for delicate children.

ROYAL MEDICAL BENEVOLENT FUND.

IT has been the practice of the Royal Medical Benevolent Fund for many years to present to the annuitants and some of the most necessitous grantees a Christmas gift of 25s. The treasurer now makes an appeal for £370 to keep up this practice. The committee has not in hand any special fund to draw upon to meet this Christmas gift, to which the recipients in former years are no doubt looking forward. It is a gracious and friendly act, and we have no doubt that many readers will wish to make the continuance possible. Subscriptions may be sent to the honorary treasurer, Sir Charters Symonds, at the offices of the Fund, 11, Chandos Street, Cavendish Square, London, W.1.

At the last meeting of the committee forty-nine cases were considered and £676 voted to forty applicants. The following are notes on some of the cases relieved.

Widow, aged 54, of M.R.C.S. who died suddenly this year. Left with two sons and one daughter, all of whom are training. Applicant hopes to have about £65 a year when her husband's estate is settled. Her private income is £20, and she has a resident post at £28. She asks for help to meet the second son's fees up to Christmas. Voted £35.

Widow, aged 43, of M.B.Lond. who was recently removed to a mental hospital as a free patient. She has two girls and a boy; the eldest girl is at a boarding school paid for by her godmother, the boy at a boarding school, and the youngest is with applicant. They are now living on the amount received from the sale of the practice, and the money is nearly exhausted. The Fund was asked to help with the boy's school fees, as the applicant hopes to manage to meet her other expenses by sweetmaking and needlework. Voted £21 10s.

Widow, aged 74, of M.D.Lond. who died in 1915. She has maintained herself by teaching, but owing to age and ill health finds it difficult to continue. Her expenses are about £2 a week and her income is from the Freemasons, £56 per annum, and from a merchants' guild, £40. Fund voted £30 in two six-monthly instalments.

Daughter, aged 50, of M.D.St. And. who died in 1880. Was brought up by a sister and since leaving school has maintained herself. Now only able to get temporary posts. Voted £5 and asked to let the Fund know how she is getting on.

Daughter, aged 55, of L.R.C.P.Ed. who died in 1878. She is without private means, and has supported herself since 1907. A relative allows her 10s. a week, and for some time she has been living on her savings, which are rapidly becoming exhausted. Some friends have given her hospitality temporarily. Voted £25 in four quarterly instalments.

Widow, aged 58, of L.R.C.P. and S.I. who died in 1911. She has maintained herself and daughter since the death of her husband, but owing to indifferent health is not able to do heavy work and is now only earning 10s. a week; the Irish Medical Benevolent Fund has sent her £15. Voted £20.

The Royal Medical Benevolent Fund Guild still receives many applications for clothing, especially for coats and skirts for ladies and girls holding secretarial posts, and suits for working boys. The Guild appeals for second-hand clothes and household articles. The gifts should be sent to the Secretary of the Guild, 58, Great Marlborough Street, W.1.

Medical News.

SIR HUMPHRY ROLLESTON, Bt., regius professor of physic in the University of Cambridge, will open the Bernhard Baron Institute of Pathology at the London Hospital on Tuesday next, December 6th, at 3 o'clock.

A DISCUSSION on alcohol and alcoholism in relation to problems of nutrition and health will be opened by Professor Hugh Maclean, director of the Medical Clinic, St. Thomas's Hospital, at a meeting of the Society for the Study of Inebriety, at 4 p.m., on January 10th.

A SERIES of six debates in aid of King Edward's Hospital Fund for London will be held at the Central Hall, Westminster (small hall). The subject of the first, on Wednesday, December 7th, at 8 p.m., is "Why act Shakespeare?" and the speakers are Miss Rebecca West and Mr. Ben Greet. Subsequent debates will take place on January 6th and 30th, February 27th, March 26th, and April 12th.

DR. TRAVERS SMITH will lecture for the Fellowship of Medicine on practical hints in medicine at 11, Chandos Street, on December 5th, at 5 o'clock; this lecture is free to medical practitioners. From December 5th to 17th there will be a

special afternoon course at the Infants Hospital, primarily for medical officers of welfare centres and others interested; visits will be paid to some centres outside the Infants Hospital. Lecture-demonstrations are being given daily at the West End Hospital for Nervous Diseases, and will continue until December 17th. Beginning on December 5th and continuing for two weeks, a course will be held at the Blackfriars Skin Hospital; two special clinical demonstrations will be given on December 6th and 13th. The following courses will be held in January: medicine, surgery, and the specialties at the Prince of Wales's General Hospital; diseases of children at the Children's Clinic; cardiology at the National Hospital for Diseases of the Heart (limited to 20); and psychological medicine at the Bethlem Royal Hospital. Further information may be obtained from the Secretary of the Fellowship of Medicine, 1, Wimpole Street, W.1.

AT the meeting of the Royal Anthropological Institute on December 20th, at 8.30 p.m., Dr. A. A. Mumford will give a lantern lecture on body measurements, respiratory tests, and school progress.

THE annual dinner of the staff and past and present students of the Royal Dental Hospital of London was held at the Trocadero on November 26th. Among the guests were Sir John Rose Bradford, P.R.C.P., the Hon. Sir William Goschen (chairman of the hospital), Mr. L. G. Brock, C.B. (Ministry of Health), and Professor Gilmore (president, British Dental Association). The chairman, Mr. J. S. Amoore of Hastings, recalled that he had spoken at the annual dinner as far back as 1880, when he responded for the students. What struck him most, looking back over nearly half a century of practice, was the different way in which diseases of the teeth were now regarded as compared with former times, and the manner in which the dental hospitals and schools had risen to the occasion. The dean, Mr. H. Stobie, said that at the moment there were 104 students as compared with 135 last year, but the drop was only to be expected; it was consequent upon the abnormal increase of students following the war. On the other hand, the entries for the new term were 23, compared with 14 last year. Negotiations were in progress for amalgamation for teaching purposes with Charing Cross Hospital; to have access to a great general hospital would be obviously an advantage to the students. Sir John Rose Bradford, comparing dentistry with general medicine, said that dental practitioners had one inestimable advantage. Although, like medical men, they had to deal with problems set them by nature, they had a conveniently limited field in which to work. Like medicine, again, dental science was a branch of biology; it afforded opportunities for work in comparative anatomy, physiology, nutrition, and pathology. In another respect dental practitioners had the advantage, for the only part of the human body which received legal protection from unqualified practice was the teeth.

ON November 18th, at the Lyceum Club, London, Dr. Bertha Mules gave a lunch party to forty medical women and a few non-medical friends, all interested in psychological medicine. In the afternoon a discussion on occupation in the treatment of patients was opened by Dr. Elizabeth Casson, chairman of the Committee in Psychological Medicine of the Medical Women's Federation. She described the occupation therapy of America, and spoke of the relationship of the crafts to the ordinary domestic duties of a mental hospital. Dr. Jane Walker spoke of lace-making, gardening, leatherwork, and many other occupations from the practical point of view. Many interesting and divergent lines were taken by the speakers who followed. After tea Dr. Shearer, Penshurst, opened a discussion on the treatment of the uncertified patient. She was of the opinion that the care of the minds of children, particularly schoolchildren, by doctors with specialized knowledge was as important as the care of their teeth and tonsils. Again many speakers contributed points from widely differing types of experience.

DR. JAMES G. MACASKIE, on his retirement from practice in Bamburgh after forty-eight years, has been presented by his patients and friends with a combined attaché and writing case, together with a cheque and a list of subscribers on vellum, and Mrs. Macaskie with a fitted handbag.

THE seventh conference of the National Medical Association of China will be held in the Peking Union Medical College from January 27th to February 2nd. Further information may be obtained from the secretary, Dr. C. E. Lim, at the Peking Union Medical College.

THE Alvarenga Prize for 1927 has been awarded by the College of Physicians of Philadelphia to Dr. Emil Bogen of Cincinnati, Ohio, for his essay entitled "Drunkenness." The next award of the prize, amounting to about $300, will be made on July 14th, 1928. Essays intended for competition may be upon any subject in medicine, and should represent an addition to the knowledge and understanding of the subject based upon original or library research. Essays must be received by the secretary of the College of Physicians of Philadelphia, 19, South 22nd Street, Philadelphia, Pa., U.S.A., on or before May 1st, 1928.

THE Langley Memorial Prize, which was founded by a friend of the late Dr. W. H. Langley, C.M.G., principal medical officer of Southern Nigeria, has been awarded to Dr. A. S. Burgess of Accra, Gold Coast, West Africa, for his paper, "The selection of a strain of *Bacillus pestis* for the preparation of vaccine, with special reference to the effect of animal passage on virulence."

DR. ALICE BLOOMFIELD has been granted an extension of the William Gibson Research Scholarship of the Royal Society of Medicine for a third year. The next award of the scholarship will therefore be made in June, 1929.

THE awards in connexion with the Buckston Browne Prize of the Harveian Society of London for the best essay on "The pathology, diagnosis, and treatment of new growths originating in the walls of the urinary bladder" are as follows: Mr. Lionel R. Fifield, F.R.C.S., £100 and medal; proxime Accessit Mr. M. F. Nicholls, F.R.C.S., £10. The president, Dr. E. Le Fevre Payne, assisted by Sir John Thomson-Walker and Mr. Girling Ball, acted as assessors. An epitome of the prize essay will be read by Mr. Fifield at the meeting of the society on Thursday, December 8th, at 8.30 p.m., at the Town Hall, Paddington. The presentation of the medal and cheques will take place at the annual general meeting, to be held on January 12th at 11, Chandos Street, W.1, at 8.30 p.m.

THE Queen Alexandra Sanatorium Fund, which provides grants to enable tuberculous patients with limited means to receive sanatorium treatment at Davos, has expended approximately £1,775 during the year 1926–27, and the maximum number of grants was made. The new scheme, whereby patients reside in approved houses of their own choice and receive a block grant of 50 francs each week, continued to work satisfactorily during the second winter since its adoption. No grants were made for the summer of 1926 or for later than May, 1927. The honorary secretary of the fund is Mr. D. Vesey, 97, Warwick Road, S.W.5.

PLANS have been approved for the new casualty department of the Royal Sussex County Hospital, Brighton, for which Mr. Bernhard Baron has presented a donation of £10,000. The accommodation will include a surgery, a minor operating theatre, a sterilizing room, and waiting rooms.

THE medical congress at Cairo known as the Journées Médicales d'Egypte has been postponed until December 15th, 1928, in view of the fact that the Egyptian Government proposes to commemorate then the foundation of the School of Medicine in Cairo.

THE fourth International Congress of Military Medicine and Pharmaceutics, which was held at Warsaw in 1927, decided that an international bulletin of these subjects should be published monthly in the *Archives Medicales Belges*, commencing next January.

MR. JOHN D. ROCKEFELLER has offered to the Memorial Hospital of New York five annual donations of 60,000 dollars for the investigation of cancer.

THE International Labour Office has published thirteen more leaflets (Nos. 69–81) dealing with nitrous fumes, hot and humid atmospheres, liquid air, air testing in workrooms, occupational diseases of agricultural labourers, nitrocellulose, slaughter-houses, celluloid, the jewellery industry, the manufacture of buttons, poisoning by arsenic, pitch, and electric lamps. They may be obtained from the London Correspondent of the International Labour Office, 12, Victoria Street, S.W.1.

THE Food Education Society, 24, Tufton Street, Westminster, has published in pamphlet form the paper on "The reform of institutional housekeeping: a new career for women," read by the honorary secretary of its Joint Hospital Matrons and Schools Committee at the Hospitals and Institutions Conference in May. Copies, post free, 7d. on application.

A FARM for cancer research has been presented to the Yorkshire Council of the British Empire Cancer Campaign by Messrs. Harold and Norman Sutcliffe. The value of the gift is estimated at £3,000, and it is hoped that important results in research will follow the experiments rendered possible in the case of larger animals, such as pigs.

THE Ministry of Health has issued a revised list of approved sanatoriums and other residential institutions for the treatment of tuberculosis in England and Wales. It is published by H. M. Stationery Office, price 2d. net.

PROFESSOR H. LEO has been nominated professor of pharmacology at Bonn, and Dr. Gösta Forssel professor of medical roentgenology at Stockholm.

PROFESSOR MARCEL LABBÉ has succeeded the late Professor Gilbert as president of the International Association of Thalassotherapy.

AN association was formed in Hungary in 1883 by the professors of the medical faculty to promote post-graduate study by general practitioners. The instruction was free, and during the first fifteen years 1,000 doctors took part in 14 courses. In 1910 the Minister for Public Education appointed a committee of management, and from 1911 to 1926 it organized 141 courses for 3,360 practitioners, and published under the title of *Orvosképzés* a periodical containing post-graduate articles; up to the present time eighteen volumes have been published. The courses, which are still free, include an annual one lasting a fortnight and dealing with internal medicine, surgery, and other departments; courses, each of a month, in various clinics; special courses, lasting one week, for tuberculosis, venereal diseases, infant diseases, injuries, and social hygiene; and weekly demonstrations. The president is Professor E. de Grósz and the secretary is Professor B. Johan; the address of the Hungarian Medical Post-graduate Committee is Mária-utca 39, Budapest VIII.

WE have received the second issue of *Archivos de Hygiene*, the official publication of the Brazilian Department of Public Health. It contains seven original articles, with summaries in French and English, on tuberculosis, yellow fever, alimentary hygiene, leprosy, the hospital problem in Rio de Janeiro, and malaria, statistics of cancer in Rio de Janeiro, abstracts from current literature, and public health intelligence.

Letters, Notes, and Answers.

All communications in regard to editorial business should be addressed to ***The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.***

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The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 4737 Dublin), and of the Scottish Office, 6, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS.

WHOLEMEAL BREAD.

DR. W. H. MARSHALL (East Grinstead) writes: With reference to the present agitation for "wholemeal bread," can anyone tell the man in the street how to recognize the genuine article? A label of "wholemeal" in the loaf or on the packing paper appears to afford no guarantee as to the amount of Vitamin B in the flour, before or after baking.

COLD HANDS.

DR. JAMES HOLMES (Bury) writes: If "W. G." (BRITISH MEDICAL JOURNAL, November 12th, page 905) will first put on a pair of loosely fitting kid or other leather gloves, and draw on, over them, a pair of ordinary woollen gloves, he will, I think, find a remedy for his trouble. I have followed this plan in cold weather for over forty years, and find it much more satisfactory than lined gloves. With a little care he can draw both gloves either on or off as though they were one.

PAIN IN DISSEMINATED SCLEROSIS.

DR. G. A. FERRABY (Nottingham) writes: If the pain described by "G. P." (October 22nd, p. 765) is due, as seems possible, to muscular cramp, I would suggest the trial of small doses of copper sulphate three times a day for a few days at a time. This often gives prolonged immunity from cramp. Copper sulphate 5 grains, dilute sulphuric acid 5 minims, and chloroform water to 6 ounces given in teaspoonful doses is satisfactory, but lately I have used tablets, 1/10 grain in each (made by Messrs. Southall's of Birmingham). The remedy was mentioned in this JOURNAL over thirty years ago, and since then I have frequently used it, as a rule with satisfactory results.

ANGIO-NEUROTIC OEDEMA.

DR. G. E. M. SCOTT (Carnegie, Victoria, Australia) writes in answer to "Ajax" (JOURNAL, August 20th, p. 331): I recently had a case of angio-neurotic oedema under my care and found that 10-grain doses of calcium chloride given thrice daily produced the best result. This patient, in addition to swellings on the limbs, suffered enlargement of the soft palate and uvula. He found that a gargle of saline (used warm) was the best; he had also used glycerin of tannic acid as a paint. So far the swelling has not advanced further down the throat. The patient was tested for sensitivity to various food proteins, but without result.

LETTERS, NOTES, ETC.

ETIOLOGY OF THE COMMON COLD.

DR. V. S. CHENEY, medical director in a large packing firm in Washington, has informed the American Public Health Association that investigations have led him to conclude that the organisms usually considered as the causative factors in the common cold are only secondary invaders which appear in the later stages. He thinks the primary cause is a mild acidosis resulting from the ingestion of too much protein, lack of exercise, and pre-existing infections elsewhere in the body. He believes that colds can be prevented and cured by retaining an alkaline balance in the body by means of diet and carefully regulated doses of sodium bicarbonate or alkaline waters, together with small quantities of calcium iodide and iodine. He incriminates climatic variations only in so far as they inhibit normal activities; thus too much is eaten and too little exercise is taken in cold weather. He finds that colds occur in his particular industry most often on Mondays and the days following holidays and banquetings. He adds that about 45 per cent. of absenteeism in large factories is due to colds or their after-effects. More confirmatory evidence will be required, however, before we can dismiss the prevalent view that colds are primarily the result of exogenous infection, rather than of defective metabolism.

A DISCLAIMER AND AN UNDERTAKING.

DR. C. AYTON MAKRETT (St. Leonards) writes: Referring to paragraphs which appeared in the lay press a little time ago, I write to say that I regret the appearance of such paragraphs in the lay press to the effect that I had acted as anaesthetist for an unqualified person. I recognize that it is against public interests and contrary to the ethics of the profession for a registered medical practitioner to act in such a manner. I have not now any connexion of the kind with any unqualified practitioner, and I will not in the future in any circumstances act in a similar capacity to any unqualified person or persons.

CATARACT AND ULTRA-VIOLET LIGHT.

DR. PERCY HALL (London, W.) writes: The communication upon this subject by Mr. Bishop Harman, which appears on page 965 of the JOURNAL of November 19th, is, in my opinion, misleading and incorrect, and I feel should not be permitted to pass unchallenged. Mr. Bishop Harman makes, in his premisses, several cardinal errors. To begin with, he states "Ultra-violet light is injurious to the eyes. The naked arc, if it be focused on the macula, will cause a scotoma or blind spot which may leave permanent damage." The "naked arc" means nothing unless qualified. I take it that Mr. Harman means an arc light which contains a small proportion of ultra-violet light and a very large proportion of intensely luminous rays. I suggest to him that it is these luminous rays which cause the ill effects to which he refers. This confusion, which exists so commonly in the minds of medical men when referring to ultra-violet light, provokes an immense amount of misunderstanding, and leads them to form hasty opinions, often far from correct.

In practice, ultra-violet light is rarely, if ever, used alone, but is in combination with luminous light, luminous heat, and infra-red rays, the proportions differing profoundly according to the source. The effects upon a patient of exposure to a given source depend upon the spectrum of emission afforded by that source, and by the proportionate amounts of various wave-lengths in that emission, as well as the total intensity of the source in its different constituents, and also upon other factors such as target skin distance, exposure time, and idiosyncrasy of patient. In drug therapy the mode of administration, whether oral, intravenous or hypodermic, profoundly affects the action of the medicament employed, just as also do the actions of drugs differ according to the dosage, and according to whether they are given alone in a state of purity, or in combination with other remedies. The action of the various alkaloids of opium given separately is vastly different from that of opium itself, and the physiological effects of opium differ enormously according to whether the dose is minute or large. Similarly, strychnine is a poison and in incorrect doses would produce fatal results, yet it is commonly administered in therapeutic doses with good results. It can safely be said that these remarks apply with still greater significance when radiant energy in the form of light is the therapeutic agent in question.

Exposure of patients to sunlight is not comparable to the exposure of patients to any of the commonly used sources of artificially produced ultra-violet light. Neither is it possible to compare the Alpine sunlight with Indian sunlight. In the one there is a relative absence of heat rays, whilst in the other there

is a preponderance. As far as I am aware there are no statistics to show that the incidence of cataract is high amongst the inhabitants of the high Alps. On the other hand, it is common knowledge that cataract is very prevalent amongst the native population of the plains of India. Cataract formation is also common, or said to be, amongst glass-blowers. It has also been noticed that dogs allowed to lie before glowing fires are apt to suffer from cataract formation.

I suggest to Mr. Harman that it is the heat rays, and not the ultra-violet rays, which cause cataract. He states that cataract changes, in their earliest stages, are commonly found in the lower half of the lenses. I suggest that this is further proof that heat rays, and not ultra-violet rays, are the cause. The eyelids protect the upper half of the lens from direct sunlight and its actinic content, and the eyelids do not permit of ultra-violet light to pass through them. Any that may get through is again filtered out by the cornea. No ultra-violet is reflected by the earth. On the other hand, the heat rays penetrate through the eye to the lens, and are also, to some extent, re-radiated by the earth. I would further point out that nowhere on the earth do solar radiations contain more than one-half an octave of ultra-violet, but from artificial sources much more is available. In exact terms, the solar spectrum *at its best* only goes down to 2,900 A.U. or thereabouts, whilst from the commonly employed artificial sources the ultra-violet wave-lengths down to 2,000 A.U. and still shorter are emitted.

I myself have treated several cases of early cataract formation by actinotherapy, with considerable improvement in vision resulting. I believe that everything depends upon the technique of administration, and that this method does demand more extended trial. There is evidence that excessive doses of *x* rays lead to the formation of epitheliomatous changes in the tissues. Nevertheless, *x* rays are in increasing use to-day, with the full approval of surgeons, for the treatment of cancer. I would therefore beg Mr. Bishop Harman to postpone judgement yet awhile before coming to the conclusion that "treatment with rays will not benefit cataract. Indeed, there is some evidence that it is liable to cause cataract."

*** We have referred this letter to Mr. Bishop Harman, who replies: It is common ground that sunlight conveys rays which range from the invisible ultra-violet rays through the luminous spectrum to the invisible infra-red heat rays. Heat rays do produce cataract—for example, glass-blowers' cataract—but the lens opacities found in these cases are characteristic, and differ materially from those of any other form of cataract. We have no knowledge that luminous rays as such affect the lens adversely. Ultra-violet rays certainly do affect the eyes injuriously. If Dr. Hall will refer to the report of the committee on the Causes and Prevention of Blindness (Interim Report regarding Alleged Dangerous Lights in Kinema Studios, H.M. Stationery Office, 1921) he will find conclusive evidence of the truth of this statement. There was a sharp outbreak of eye inflammation in film studios which provoked questions in Parliament. The matter was referred by the Minister of Health to the committee then sitting. I was a member of that committee, and well remember the care with which the evidence was sifted, and the visits made to the film studios. The outbreaks were similar in character to what is known as "snow blindness." The symptoms were very painful and alarming, but happily they were transient. The committee concluded that the outbreak was due to the exposure of the artistes to naked arc lights. When these lights were properly screened by transparent glass or glass silk (which cut off the ultra-violet rays) the outbreaks ceased. I have heard of no further occurrences. Anyone who has seen a film in the making in a studio, with its huge batteries of arc lights, spot lights, and mercury vapour lamps, must have been amazed at the intensity of the illumination. Yet this, when employed with glass screens, causes no trouble. This outbreak in the film studios was a large-scale test the like of which is not likely to occur again. It afforded evidence that ultra-violet rays are injurious to the eyes, and ample justification of my warning against their use upon the eyes. Reference may also be made to Mr. Duke-Elder's book, *Recent Advances in Ophthalmology* (p. 229): he says, "There is also a considerable amount of evidence which associates the occurrence of senile cataract with the action of the long ultra-violet rays in sunshine, for, as we have seen in a previous chapter, rays from 3,000 to 4,000 A.U. are absorbed in considerable quantities by the lens. Finally, cataract has been reported after three therapeutic exposures to large doses of *x* rays or the gamma rays of radium."

PASSAGE OF RENAL CALCULUS THROUGH URETHRA.

"G. E.," a medical practitioner who has recently suffered from renal calculus, sends an account of the course of his case until its termination by passage of the stone through the urethra: Early symptoms suggested gastric ulcer and, later, appendicitis; the gastric symptoms were relieved after operation, only some discomfort and acidity remaining. Some six months ago he was attacked by pain in the lower abdomen, which passed off without treatment in about an hour. After being free from symptoms for about a month he had repeated attacks of pain in the lower abdomen; the pain eventually was more pronounced on the left side and was only relieved by morphine. When the acute symptoms passed off his condition was almost that of collapse, and there was frequent micturition, with pain at the neck of the bladder after the act of micturition. He was *x*-rayed in July, and a stone was demonstrated in the left ureter; this was confirmed by a later cystoscopic examination. This examination was performed without general anaesthetic, but much pain followed the injection of beta borocaine, and for about thirty-six hours subsequently the act of micturition was accompanied by severe pain and passing of blood. All bladder symptoms disappeared within about forty-eight hours, and there was freedom from pain and discomfort for nine days, when severe pain in the lower abdomen began again. Great irritability of the bladder followed, with constant desire to micturate; only small quantities of urine were passed, and each act was followed by severe pain, lasting only a short time, round the neck of the bladder. This condition continued for two days, when a stone was passed through the urethra. Pain and irritability of the bladder gradually passed off, and there have been no symptoms since.

A SOUTH AFRICAN WINTER RESORT.

HERMANUS is a small town of 1,000 inhabitants, eighty miles from Capetown, which is now being developed as a seaside resort. Together with two little villages, Poole's Bay and Mossel River, it forms the coast of Hermanus. The attractions of this coast consist in the beauty of the scenery, an extensive beach for surf bathing, twelve square miles of water for boating at the Klein River Lake, and above all, the fishing, which has earned for Hermanus the name of "The Paradise of the Rock Angler." A pamphlet issued by the South African Publicity (Proprietary), Limited, gives pictures of anglers standing beside the 100 lb. kabeljaauws they have caught, or the 583 lb. of fish landed in one afternoon. There are also descriptions of the amenities of the Marine and Riviera Hotels. Dr. Love, who has sent us the pamphlet, regards Hermanus as an excellent refuge from the English winter; its climate is equable, and colds and bronchitis are almost unknown. Amongst the other attractions the pamphlet states that at the Old Year's Eve fancy dress ball "some of South Africa's most austere citizens can be seen in the most weird costumes."

INTRAVENOUS MEDICATION.

DR. E. BURKE (Darrang, Assam) writes: In reply to "Major R.A.M.C." (October 1st, p. 619) I have used iodine intravenously in many diseases with good results, employing the following formula, suggested in the *Indian Medical Gazette*, April, 1926, p. 206: Iodine (pure) 24 grains, potassium iodide 36 grains, distilled water to 1 oz. Dose: 1 to 2 c.cm. diluted with 8 c.cm. of distilled water. Each cubic centimetre of the above solution contains 1 grain of iodine. Injections should be given once or twice weekly. Once a week is usually sufficient. In cases showing marked idiosyncrasy to iodine (which very seldom occurs) the dose is halved. I have had striking results in the tea gardens in cases of pneumonia, erysipelas, cellulitis, rheumatism, septic wounds, and skin diseases, and also in bad cases of tropical phagedaenic ulcers. Iodine given intravenously is said to produce a marked leucocytosis, and to act also as a blood disinfectant.

BEVERAGES!

SIR ROBERT DONALD (London, S.W.7) writes: It may be of interest to your readers to know that the medicinal waters of Carlsbad are now admitted into England duty free. Hitherto the customs authorities were under the impression that the Sprüdel, Schlossbrünnen, Mühlbrünner, and other waters could be used as table beverages. No one could try the experiment with impunity. It is always well to have medical advice before drinking Carlsbad waters, especially away from their source.

WORDS.

DR. HEYWOOD SMITH (Chichester) writes: It seems a pity that many of our professional brethren fail to express adequately the meaning they intend to convey. There is a glaring instance on page 935 in your issue of November 19th, where I find: "Laparotomy was performed on July 25th by Mr. C. L. Isaac, who, on opening the abdomen," etc. This is a manifest contradiction in terms. Laparotomy, a word imported from America, means an incision in the flank. It should be laparatomy, as a flank is λαπαρα, not λαπαρον. The proper word, as used by Bland-Sutton and others, should be coeliotomy, from κοιλια, the belly.

OPAQUE SUBSTANCES AS AN AID TO DIAGNOSIS.

Correction.

SIR JAMES PURVES-STEWART has called attention to a mistake in the report of his remarks about heavy lipiodol (JOURNAL, November 26th, p. 937). The most generally employed method is that of injection through the *atlanto-occipital* ligament—not, as stated in the report, through the sacro-coccygeal.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 74, 75, 76, 77, 80, and 81 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 78 and 79.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *219*.